XL300

MAINTENANCE MANUAL
Part No. 105880
Rev. A

INTRODUCTION

The Maintenance Manual is a two-part document. The first part is an introduction to the printer systems and sub-assemblies and theory of operation. The second part provides troubleshooting and scheduled maintenance procedures, including corrective maintenance (removal and replacement) procedures.

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Chapter 1: GENERAL INFORMATION

1.1: INTRODUCTION

The printer is a serial matrix printer capable of producing highly legible copy on forms containing as many as six parts. It is well suited to a variety of applications. The standard ASCII code is employed, and communications may be performed over a serial interface at BAUD rates ranging from 110 to 19,200. A TTL parallel interface is also standard and is compatible with the Centronics convention.

The standard set of 96 upper and lowercase ASCII characters is printed in a 9-high by 7-wide dot matrix. True lowercase descenders and simultaneous underlining are possible because of the 9-wire printhead. Forms varying in width from 3 to 15 inches may be fed through the front or bottom of the printer, and a lever is provided to allow the user to adjust the head-to-platen gap for multi-part forms. Inking is performed by an easy-to-change cartridge ribbon.

A unique 16-key pad is located on the top cover which allows the user to define or alter any machine feature. All features, including forms status, are saved in a nonvolatile memory making setup quick and simple. An LED display is provided to function as an enunciator in Setup mode, and to show the line number in normal print mode.

1.2: FUNCTIONAL DESCRIPTION

The printer prints characters in a serial fashion by moving a 9-wire printhead in a bi-directional manner along the print line. The direction of print is determined by a text optimization routine, and is designed to maximize throughput by minimizing head motion during nonprinting intervals.

The printhead is mounted on a carriage assembly which travels on two steel shafts. The carriage is driven left and right by steel cables which are connected to a stepper drive-motor. Two additional cables drive the ribbon advance mechanism which is part of the carriage assembly. Paper is advanced by a stepper motor linked to a pin-feed tractor system through a small rubber timing belt. A single microprocessor controls the mechanical assemblies and handles the functional protocol for the printer. The microprocessor, along with its peripheral circuits, operate in conjunction with the carriage stepper motor to synchronize dot formation so that no encoder is required.

1.3: PRINTER INITIALIZATION

At power-on, the printhead is moved slowly left until the carriage reaches the left margin. This is accomplished when a small tab on the carriage engages a photosensor mounted on the left endplate. This position is referred to as the true left margin and all future printhead motion is referenced to this point. Features and forms status which were present in the printer when power was last switched off are loaded from the nonvolatile memory into working storage. Therefore, the printer should power-on in exactly the same configuration it was in when last used.

1.4: PRINTHEAD ASSEMBLY

The printhead consists of a frame, solenoids, tungsten printwires and a printhead nose. The solenoids are housed in the frame in a radial symmetrical arrangement. Each solenoid drives one printwire. The printwires extend from the solenoids through the printhead nose and are partially exposed at the tip of the printhead nose. The printhead nose houses guides which orient the printwires so they form a vertical column at the tip of the printhead nose. Heat generated by the solenoids during operation is dissipated through a heatsink which is mounted to the printhead frame. The printhead assembly is mounted on the carriage which correctly positions the printhead as the solenoids drive the printwires in order to form characters. A printwire is fired when 55 VDC is applied to a solenoid. Power from a modulated pulse-width power amplifier is supplied to the printhead solenoids via a ribbon cable.

1.5: PAPER FEEDING

The printer is designed to accommodate forms ranging in width from 3 to 15 inches. Forms must be of the pin-feed type with a hole spacing along the edge of 0.5 inch, and a diameter ranging from 0.150 to 0.160 inch. Multiple forms of up to six sheets may be used, with a maximum recommended thickness of 0.022 inch. If a form with card stock is used, the card must be the last part, and entry into the printer should be through the bottom-feed slot. The printhead-platen gap adjustment lever should be moved to its full back-position before loading forms (i.e. maximum gap). It may be moved inward (toward the platen) when printing commences until the ink starts to smudge, then back one detent. A pair of forms tractors engage the feed holes of the paper to move it through the printer. Flat sheet metal plates guide the paper, and a mylar tensioner maintains a slight drag for a flat, wrinkle-free print surface. The drive tractor may be adjusted horizontally to accommodate forms of different widths. The tractors are driven by a square shaft through a rubber timing belt linked to a stepper motor. Front panel keys are available for paper-advance and vernier alignment.

1.6: PAPER-OUT DETECTION

A photoelectric sensor is employed to detect the absence of paper. It is attached to the lower-paper guide which is mounted to the bottom side of the platen. The sensor is constructed with an infrared light-emitting diode (ILED) mounted adjacent to a phototransistor. If paper is present, light emitted by the ILED will reflect from the paper and return to the phototransistor. If the paper is removed, no light will be reflected and printing will cease.

A paper out condition will cause the paper-out indicator on the operator panel to flash and the bell will sound three times. The microprocessor will halt all printer activity and raise BUSY until paper is loaded into the printer.

1.7: BELL OPERATION

A piezoelectric transducer generates an audible tone upon receipt of the bell character. A single bell, or tone burst, is produced by applying a 2 KHz square wave to the transducer.

The occurrence of a bell tone is not synchronized to any physical attribute of the printer such as printhead or paper position.

Bells may also be generated locally in setup mode to prompt the operator when certain errors have occurred. It also alerts the operator when the paper supply is depleted.

1.8: OPERATOR CONTROL PANEL

A 16-key panel, or pad, is provided to enable the operator to define features which are programmable or selectable. Certain keys are dedicated to specific machine functions such as reset, paper advance, etc.

In addition to key switches, an LED display and several discrete LED's are located on the control panel. The individual LED's are provided to indicate status such as on-line, paper-out, etc. The 4-digit display; however, is general purpose in nature. In setup mode it is used to show feature codes, feature status, and feature values. In normal mode, it displays the location on the paper where the next line of print will occur. Certain diagnostics also employ it for fault isolation. Refer to the Operator's Manual for a detailed description of machine setup and control using the front panel.

1.9: NON-VOLATILE MEMORY

A non-volatile memory (NVM) is used to store all programmable printer parameters. Included are such things as forms length, BAUD rate, tab position, communications status, etc. The forms line number is saved in the NVM so that top-of-form position is maintained at all times unless the form is manually moved by the operator.

At power-on, if an error is detected, an error code of 6508 will be written into the 4-digit LED display on the control panel. Otherwise, operation of the printer will commence with all features and status configured as they were when power was last switched off.
Any changes are made during normal run time as needed. The only exception is in the event of a default reset. In that case, a special set of feature values are loaded into the NVM. A checksum is computed and saved along with the data for error detection at the next power on cycle.

1.10: RIBBON DRIVE SYSTEM

The printer employs a continuous loop cartridge ribbon for inking. The ribbon cartridge mounts on the carriage assembly where it registers to two guide posts and engages the drive mechanism. A pair of spring clips serve to “hold-down” the cartridge to the carriage. The drive mechanism is a mechanical device which derives its power from motion of the carriage. Power is coupled to it from two steel cables strung between the left and right endplates. Each cable is wrapped (1 turn) around a pulley which contains a unidirectional clutch bearing. The cables are strung in a fashion that causes the pulleys to rotate in opposite directions. The clutch bearings are oriented in each pulley so that one pulley drives while the other idles. Thus, the ribbon drive shaft always rotates in a counterclockwise direction. This is necessary since the ribbon cartridge cannot reverse. A spring loaded plunger is pan of the ribbon drive shaft assembly, and it is the device that engages the spindle on the cartridge.

1.11 CARRIAGE DRIVE SYSTEM

The carriage drive system consists of a permanent magnet stepper motor and a power amplifier which drives the carriage through two steel cables. The motor has an angular resolution of 1.8 degrees in full-step mode, and 0.9 degrees in half-step mode. The drive ratio between the motor and carriage is such that one full-step equals 0.010 inch linear travel. The relationship between step angle and linear motion serves as the foundation for positioned control, and dot synchronization during character formation.

The NMU relies on the inherent stepper motor operation for position control. It is assumed that the motor faithfully steps once each time it is commanded to do so. This method of control differs from most printers which employ closed loop servo motors and encoder devices. The NMU keeps track of carriage position by counting the number and polarity of steps given to the motor.

For reliable position control, it is necessary to ramp the stepper motor from one speed to another. This ramping action is under MPU control, and is accomplished by frequency modulating current excitation to the motor. With this technique, step commands are applied to the motor which take full advantage of the available torque at every speed required by the printer.

During the print cycle, dot formation is accomplished by synchronizing print-wire excitation to the motor steps as the printhead moves along the print line.

The open-loop, encoderless design of the carriage system is not a problem during a normal print cycle since the printhead is in motion, and sufficient torque is available to resist any external disturbance. However, the system is vulnerable at rest due to the lack of feedback. This could happen, for instance, if the operator manually moved the printhead during a routine ribbon change. The MPU would not be aware of the incorrect carriage position, and the machine would not operate properly when required to print the next line. This problem is avoided by returning the carriage to the left margin when the machine is idle. Since the photosensor can monitor this position, the MPU will detect any motion of the carriage away from the sensor. A restore cycle will be automatically commanded if the carriage is not positioned at the left margin when the next print line is initiated.

Since the carriage is returned to the physical left margin when the printer is idle, the logical and physical position of the printhead may not correspond. The MPU maintains the logical position at all times so that the next character will be printed in its proper physical location on the paper.

1.12: UNIVERSAL POWER SUPPLY

The power supply consists of a 50/60 Hz transformer-rectifier- filter which produces a nominal output voltage of +55 volts D.C. The +55 volt unregulated potential is used directly by the paper drive motor, carriage motor and printhead power amplifiers. The +55 volt output is also used by a switching regulator to produce regulated voltages of +5, +12 and -12 volts. The regulated voltages are obtained from a high efficiency power converter of the “fly back” variety. This type of regulator uses a single switch transistor and is able to regulate multiple outputs with only one control loop. Benefits include cool, reliable operation with a wide tolerance to line voltage fluctuations.

1.13: CONTROLLER BOARD

A single printed circuit board (PCB) contains all the digital and analog circuitry required to operate the printer subsystems and to control the operational protocol. Interface correctors are mounted to the PCB and are accessible via the rear of the printer. Connectors are also provided for the motors, printhead, and sensors.

At the heart of the digital circuitry is an Intel 8085A microprocessor (MPU). The MPU, along with several LSI peripheral devices and control circuits, utilizes a ROM-based program which operates the electro-mechanical devices and handles communications between the printer and host system.

1.14: RS-232C SERIAL INTERFACE

An RS-232C serial interface is provided and is capable of operating at BAUD rates from 110 to 19,200. Connection is via a standard 25-pin connector mounted on the PCB and is accessible through a slot in the rear of the printer cover.

To allow operation at high BAUD rates, two handshaking, or restraint, protocols are supported: XON-XOFF and DTR. Both are selectable by the operator as required.

XON-XOFF functions by sending an XOFF control code to the host when the FIFO buffer fills to a “high water” mark, and then an XON when it empties to a “low water” mark. In this manner, a host system win be able to communicate without any loss of data.

DTR functions by manipulating a hardware line to indicate the FIFO buffer status. When the printer is able to receive more data, the line will be at a positive level. When the printer is busy, the line is dropped to a negative level. This method of handshaking is preferred in many systems since no decoding of serial data is required. DTR is available on pins 20 and 11 of the serial interface connector. See Table 1-1 for a complete description of the pin configuration.

PIN	ASSIGNMENT
1. Chassis Ground	
2. Serial Data Out	Asynchronous output data line
3. Serial Data In	Asynchronous input data line
7. Signal Ground	
11. Data Terminal Ready (DTR)	Indicates the printer is open for communication and can accept or transmit data.
20. Data Terminal Ready (DTR)	

Table 1.1 Serial Interface Connector-Pin Assignment

1.15: CURRENT LOOP INTERFACE OPTION

A 20mA current loop interface is an available option. It functions in a manner identical to the RS-232C, except that photo-isolated current loops are used instead of voltage levels. Further, no equivalent of DTR restraint mode is available. The XON-XOFF mode of handshaking is not affected, and may be used if desired.

The current loop receiver or transmitter may operate in either passive or active mode. The standard factory setting is passive for both loops. When operating in passive mode, the host system must supply the excitation or drive current. In active mode, the printer provides the drive current, and the host acts as the passive device. If a loop is configured for active operation, it should be noted that there no longer exists true photo-isolation between the printer and host. This is because the printer's power supply is connected directly to the output (or host) side of the photo-isolator.

Table 1.2 shows the jumper configuration required for active and passive mode of operation.

1.16: Current Loop Installation

Table 1.2 Current Loop Installation	
PCB COMPONENTS	
R14	10K Ω (OHM)
R15	220 Ω (OHM)
R16	47 Ω (OHM)
R17	470K Ω (OHM)
R23	270 Ω (OHM)
R24	100 Ω (OHM)
D7	1N746A
D8	MCL1301
D9	1N914
U-25	4N26
U-26	4N26
Q3	MPSA06

For a passive loop, install the following jumpers: W15, W17, W19, W27

For an active loop, install the following jumpers: W29, W18, W16, W28, W26, W20

The following jumpers should be removed when installing an active loop: W15, W17, W19, W27

1.17: TTL PARALLEL INTERFACE

A TTL parallel interface is standard and is mounted on the logic board. It is compatible with most systems which have been designed to operate with Centronics printers. Certain signals found on early Centronics printers are not provided. Should any problems with compatibility arise, contact place of purchase.

The interface functions by accepting a 7-bit character code when a datastrobe transistions from high-low, to low-high. Upon acceptance of the character, the acknowledge signal is pulsed low for a short period of time. The host uses this as an indication that the character has been received, and that another may be sent. During certain nonprinting intervals, such as when paper is in motion, the busy signal is also raised to a high level. See Table 1-3 for a complete description of the pin configuration.

Table 1.3 Parallel Interface Connector Pin Assignment

PIN NUMBER	ASSIGNMENT
1	Data Strobe
2	Data Bit 1
3	Data Bit 2
4	Data Bit 3
5	Data Bit 4
6	Data Bit 5
7	Data Bit 6
8	Data Bit 7
9	Data Bit 8
10	Acknowledge
11	Busy
12	GND
13	+5
14	Ground
15	---

Table 1.3 Parallel Interface Connector Pin Assignment

PIN NUMBER	ASSIGNMENT
16	Ground
17	Chassis Ground
18	W7 Jumper to 5V Not Installed
19	*Twisted Pair Ground
20	*Twisted Pair Ground
21	*Twisted Pair Ground
22	*Twisted Pair Ground
23	*Twisted Pair Ground
24	*Twisted Pair Ground
25	*Twisted Pair Ground
26	*Twisted Pair Ground
27	*Twisted Pair Ground
28	*Twisted Pair Ground
29	*Twisted Pair Ground
30	*Twisted Pair Ground
31	---
32	+5V
33	Ground
34	---
35	---
36	---
	*Grounds are effective only if twisted pair cabling is used.

1.18: PHYSICAL CHARACTERISTICS

The printer is packaged in a compact enclosure suitable for use on a desktop, or for mounting to an optional free-standing pedestal. Dimensions for the printer and the pedestal

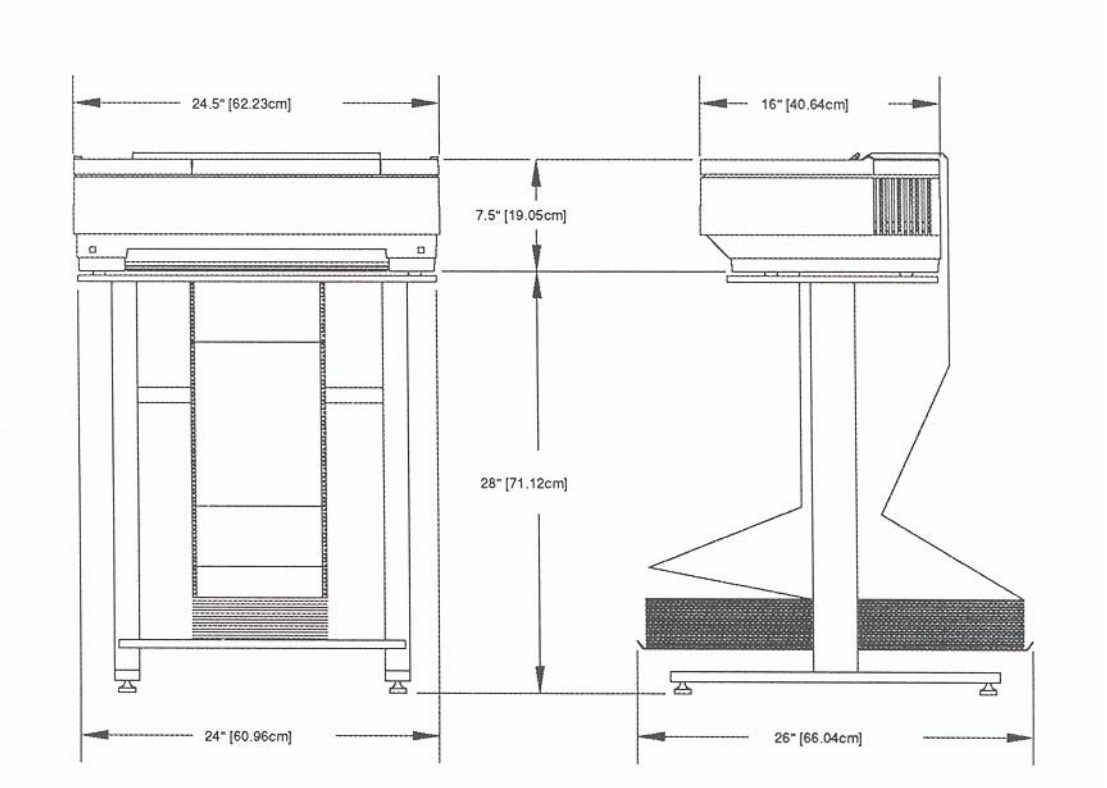

Figure 1.1: Spacial Requirements

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Chapter 2: THEORY OF OPERATION

2.1: INTRODUCTION

All printer electronic subassemblies, with the exception of the power supply, are contained on one printed circuit board (the controller board). This chapter provides the technician with descriptions of the various circuits contained on the controller board, ie. printhead driver circuit, carriage drive circuit, and an overview of the microprocessor system.

2.2: MICROPROCESSOR SYSTEM

The microprocessor system consists of an Intel 8085 microprocessor, two Intel 8155 RAM/ 1/0 /Timer chips, an Intel 8251 USART, EPROMS, 26K bytes of accessible RAM (see Figure 2.1). 2K bytes of RAM are battery backed up. The RAM's are used for input FIFO, line buffers, dot buffers and general purpose workspace. The EPROM contains dot patterns for printable characters and software pro, 7 rams (firmware) required to perform various printer functions. The Intel 8155's are used for general purpose 1/0 and the parallel interface. They also provide timers for determining baud rate and processor interrupts. The Intel 8251 USART converts the serial data arriving at the RS-232 port into parallel form for the processor. The processor reads this data and stores it in the FIFO buffer. Communication with the operator is through the processor polled keypad, the 4 seven-segment displays and the various LED's on the front panel.

When power is turned on a resistor-capacitor network attached to the 8085 generates a reset signal which causes the processor to begin program execution at address zero.

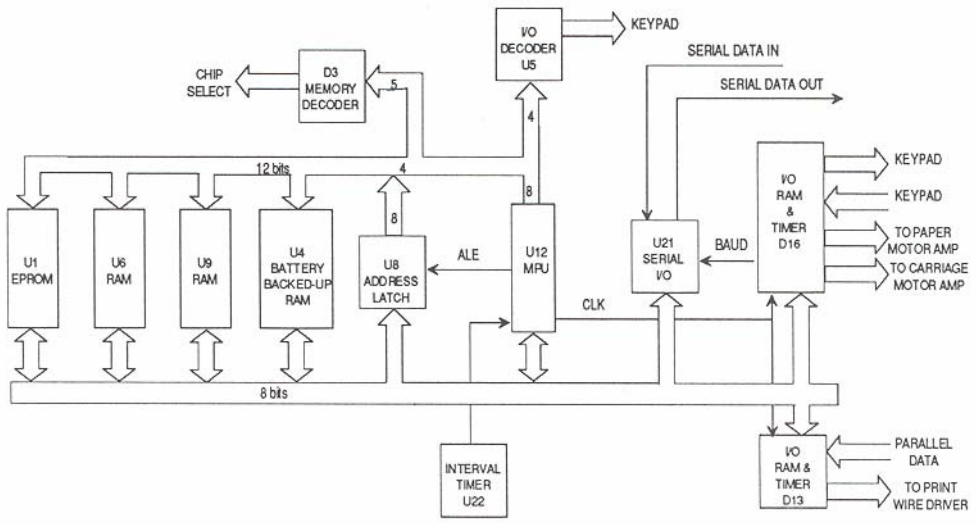


Figure 2.1 Functional Block Diagram

2.3: CHARACTER PRINTING

Incoming characters are taken from the communications interface (either serial or parallel) and placed into a FIFO buffer. The characters are then placed into a print buffer to construct the next line to be printed. No printing occurs until all data for that line of print has been received and the printer receives a line terminator (e.g. line-feed, vertical tab, form feed). Upon receipt of the line terminator, the microprocessor examines the present speed and position of the printhead. This information along with the format of the new print line enables the microprocessor to select the optimum print direction (hence the term "logic seeking"). The microprocessor examines the first character in the print buffer to be printed, retrieves the dot pattern for this character from ROM and places the dot pattern in a dot buffer. The dot pattern is then loaded into a printwire latch. When the printhead achieves the correct position, the dot pattern is sent to the printhead power amplifier. Seven sub-columns are required to completely define each character. Dots in each sub-column are formed by energizing solenoids which cause the wires in the printhead to impact the ink ribbon and paper.

2.4: PRINTHEAD THEORY OF OPERATION

The printhead contains nine individual solenoids which must be energized selectively. Each solenoid has a darlington transistor with which to select it. The length of time which the solenoids are energized is critical to printhead performance. This length of time is determined by a mono-stable multi-vibrator which enables the darlington transistors for a fixed amount of time.

When the solenoids are energized they are driven in a voltage mode. There are three distinct, sequential periods which occur. (See Figure 2.2).

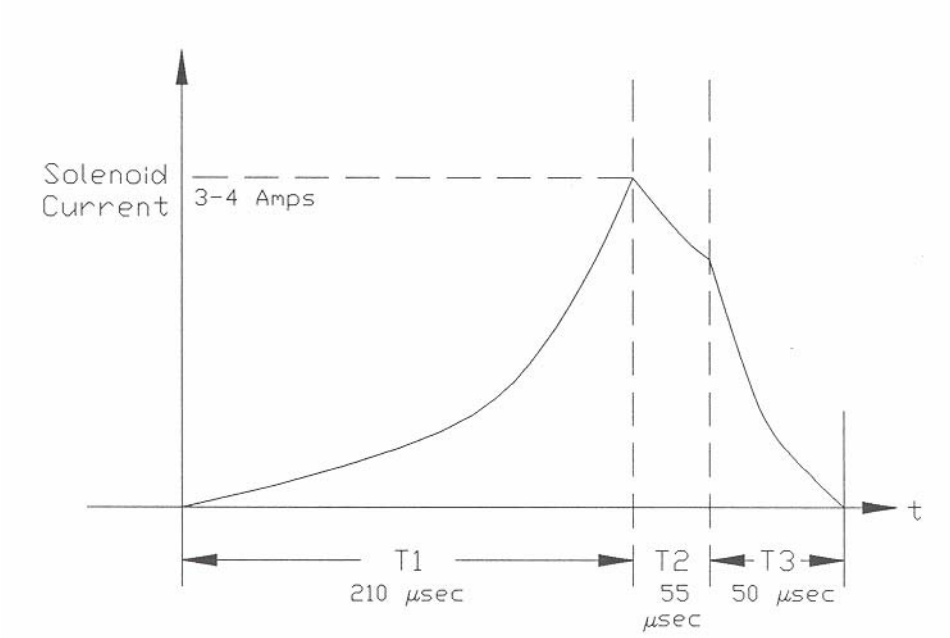


Figure 2.2 Printhead Solenoid Current Waveform

T1 is the current rise period, during which the fun power supply voltage is applied to the solenoid to build the current up as quickly as possible. T2 is the slow decay or “free wheeling” period. The supply voltage is removed and current is allowed to re-circulate through the solenoid. T3 is the fast decay or “fly back” period.

The sequencing of these periods is controlled by timers. When the solenoids are energized two timers are started. The first timer controls period T1; when it expires, the voltage source is removed. The second timer controls the transition from T2 to T3. When it expires, the darlington select transistors are disabled forcing the solenoid into the “fly back” mode.

2.5: PAPER MOTOR

Paper motion is provided by a 7.5 degree, two phase, permanent magnet stepper motor. The pin feed tractors are driven by the motor through a timing belt. The motor is geared so that 8 steps of the motor advance the paper 1/6 of an inch.

The motor is controlled by the microprocessor which provides the step sequencing and timing functions (see Figure 2.3).

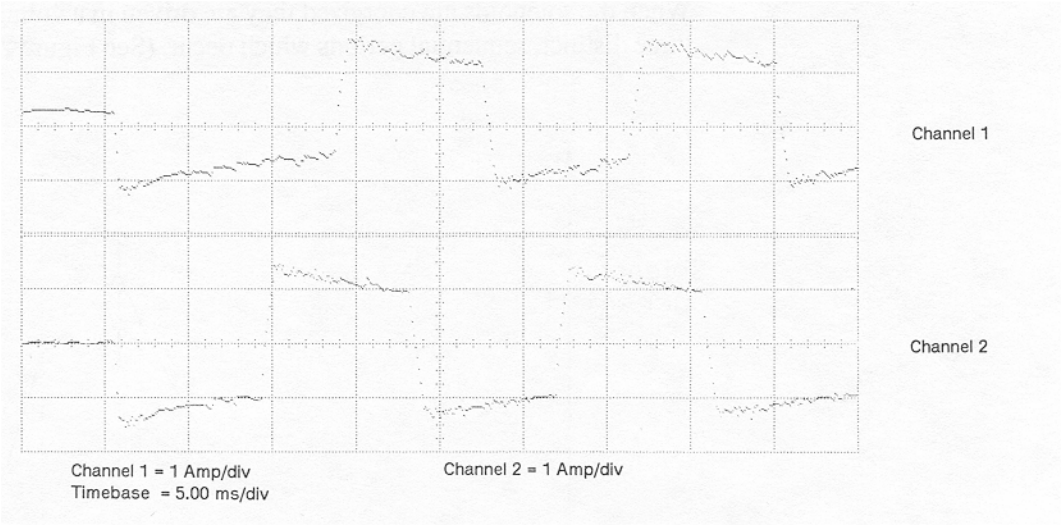


Figure2.3 Paper Motor Current Waveforms

Power is delivered by a chopping current regulator operating off the +55V supply. Power can be cut off from the motor by disabling the “system ready” (see section on system clamp). When the printer is idle system ready is disabled by the processor and the motor is not energized. When the paper feed motor is idle and system ready is enabled, the amplifier will maintain a holding current of 0.5 amps in each winding of the motor. Any change at the inputs to the paper feed amplifier (ie. a step command) is detected by the amplifier which responds by increasing its current limit level. This is achieved by changing the reference voltage on the comparator in the current limiting circuit.

2.6: CARRIAGE DRIVE

Carriage motion is controlled by a stepper motor. The motor is a 1.5 degree two-phase type. The carriage is driven by the motor through a capstan and set of wire cables. The capstan is sized so that one step of the motor corresponds to 1/100 of an inch (the separation of sub-columns at 10 characters per inch).

The motor is controlled by the microprocessor which provides step sequencing and timing functions. The motor can be stepped in one phase-on or two-phase-on modes. This dual capability means the motor can be half stepped. When motion begins, the step rate is ramped up to the running rate, and correspondingly the step rate is ramped down to a stop at the end of a motion. The motor is half-stepped whenever the step rate is less than the motor's resonant frequency.

Power is delivered by a chopping current regulator operating off the +55V supply. Power can be cut off from the motor by disabling the “system ready” (see section on system clamp). When the printer is idle “system ready” is disabled by the processor and the motor is not energized. When the carriage motor is idle and system ready is enabled, the amplifier will maintain a holding current of 0.5 amps in each winding of the motor.

Any change in the inputs to the carriage amplifier (ie. a step command) is detected by the amplifier which responds by increasing its current limit level. This is achieved by changing the reference voltage on the comparator in the current limiting circuit.

Because the carriage motor runs open loop, the microprocessor must keep track of carriage position by keeping track of steps it commands the motor to take. Upon initialization at power on, the processor must locate the position of the carriage. This is accomplished by moving the carriage to the left side of the mechanism until it interrupts the photo-interrupter switch located on the left end plate.

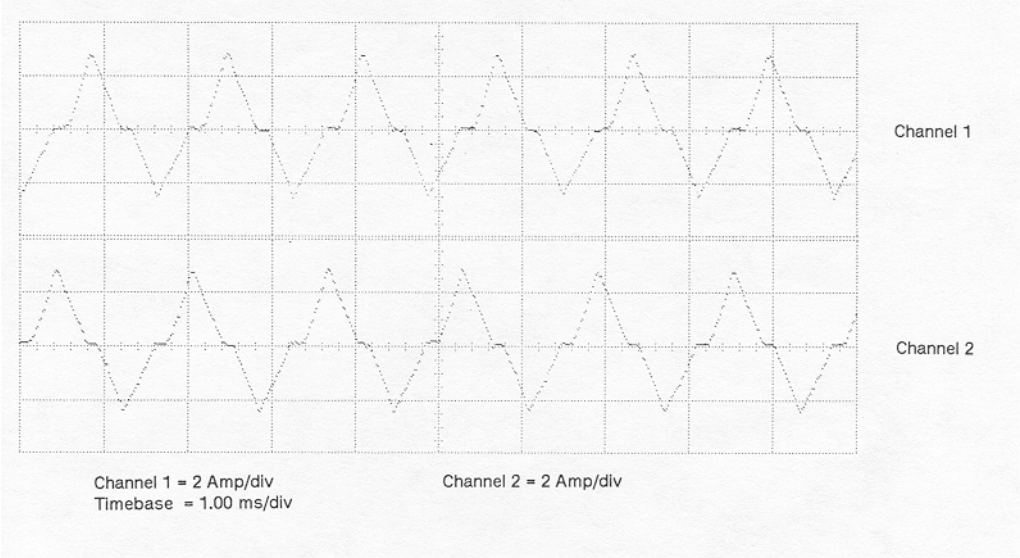


Figure 2.4 Carriage Motor Current

2.7: SYSTEM CLAMP

The system clamp allows the processor to energize or de-energize the motors by toggling a 1/0 bit. Any time a motor is moved, the 1/0 bit "system ready" must be enabled. This allows step data to be converted to motor current. Therefore, anytime "system ready" is enabled, motors are either stepped by changing step data, or clamped by unchanging step data present at the input of the amplifier. "System ready" also enables the printwire driver circuit.

Chapter 3: Troubleshooting

3.1: Introduction

This chapter provides the technician with procedures for troubleshooting the printer. The following table summarized some of the more common problems which may be encountered with the printer. A brief description of the problem is provided with one or more possible causes for each.

Table 3.1 Troubleshooting

PROBLEM	POSSIBLE CAUSE
Printer completely inoperative - no printhead motion - no panel indicators illuminate	No AC power applied (line plug not in) Line fuse blown Power switch defective DC power connector not connected to controller board (always allow at least 1 minute after AC power is shut-off before handling the DC connector)
Printhead does not move to left margin when power is applied - power indicator illuminates	Carriage motor connector not seated Defective controller board
Printhead moves to the right and stops when power is applied	Left margin sensor not plugged in on controller board Defective left margin sensor Trash or debris blocking light slits on margin sensor Defective controller board
Printhead moves left when power is applied but does not stop when left sensor is engaged (i.e., Carriage chatters against the left endstop)	Left margin sensor defective Controller board defective

Table 3.1 Troubleshooting

PROBLEM	POSSIBLE CAUSE
Printhead motion is erratic (with excessive vibration during power-on restore or normal print cycles). Carriage may stall with little or no motion produced.	Broken wire on carriage motor connector Defective controller board Loose setscrew on carriage drive pulley Defective idler bearing in carriage cable drive system Carriage cable tension too low
Erratic printhead motion	Excessive drag caused by defective sleeve bearings or ribbon advance mechanism Defective carriage motor
Fading character formation	Defective ribbon cartridge Ribbon-advance drive cable tension too low Spring-loaded drive spindle not engaging cartridge Defective ribbon advance mechanism
Printhead moves properly but no characters are printed	Ink ribbon does not advance when printhead is in motion (see above) Printhead power cable is not connected (check both ends) Manual detent lever improperly adjusted Defective controller board
A single dot missing in every character along the horizontal	Defective printhead wire (mechanical) Bent pin on the electrical connector at the printhead or controller board (plug at controller board may be displaced by one or more pins) Platen needs adjustment (only if missing dot is top-most one)

Table 3.1 Troubleshooting

PROBLEM	POSSIBLE CAUSE
Inconsistent character formation (dots print dark and light in a random fashion)	Manual detent lever improperly adjustment Platen adjustment needed Defective power driver on controller board Erratic ribbon advance (see fading character symptom)
One side of printline darker than other, or dot formation better on one end than the other	Platen alignment needed
Characters print light near top or bottom of each character	Excessive platen tilt - platen alignment needed
Elongation or compression of characters, improper registration	Loose setscrew on carriage drive pulley Carriage drive cable tension too low Defective carriage motor Defective idler pulley Defective controller board
Contiguous dots along the horizontal fade on one end, or appear light and smeared. Sometime tears ink ribbon (particularly prevalent on double-wide characters)	Defective controller board Defective printhead

Table 3.1 Troubleshooting

PROBLEM	POSSIBLE CAUSE
Paper fails to advance properly upon receipt of a line-feed code but only on a random basis	Paper binding external to printer due to table edge or paper-box Tractor-drive belt needs adjustment Tractor-drive pulley is loose (check both motor and drive shaft pulleys) Tractor-drive shaft bent and binding Defective controller board Defective paper-drive motor
Paper does not advance at all (line or local), or is erratic - sometime running in reverse	Defective controller board Broken wire at paper-feed motor connector Mechanical binding (see above sympton) Defective paper-drive motor
Paper advances one or more lines without an apparent motion command from the host	Skip-over perforation features are set Host sending LF, VT, or FF due to malfunction Defective controller board
Paper does not advance to proper position after auto-skip of FF code	Forms control and/or auto-skip parameter improperly set Vertical pitch set wrong Host sending LF, FF or VT code Defective controller board
Paper slew continuously when powered on	Advance or Form Feed key stuck on operator panel Large number of FF codes buffered from host (Reset will stop paper if so)
Paper will not advance upon receipt of FF code, but does when Form Feed key is used	Form feed defeat is set

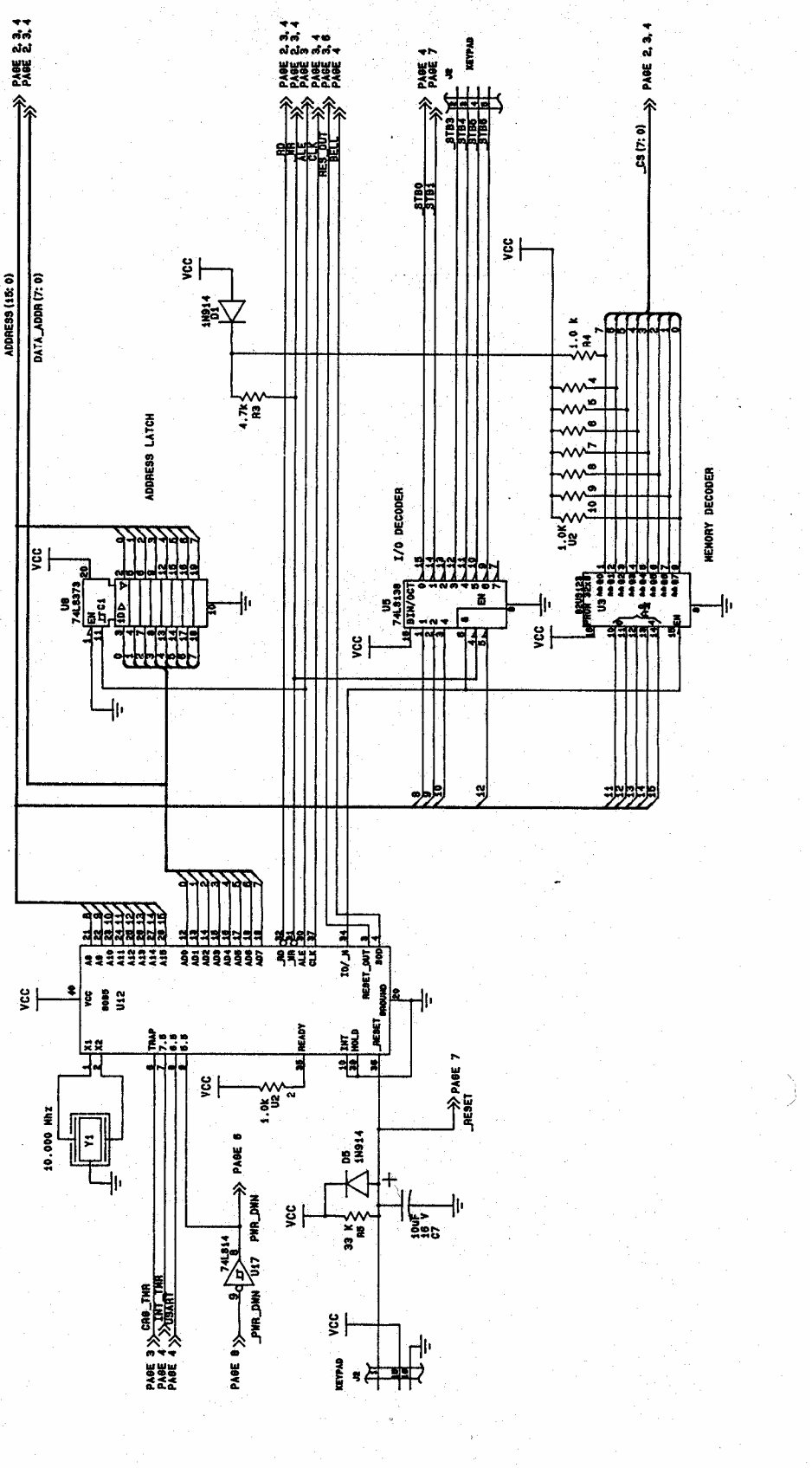
Table 3.1 Troubleshooting

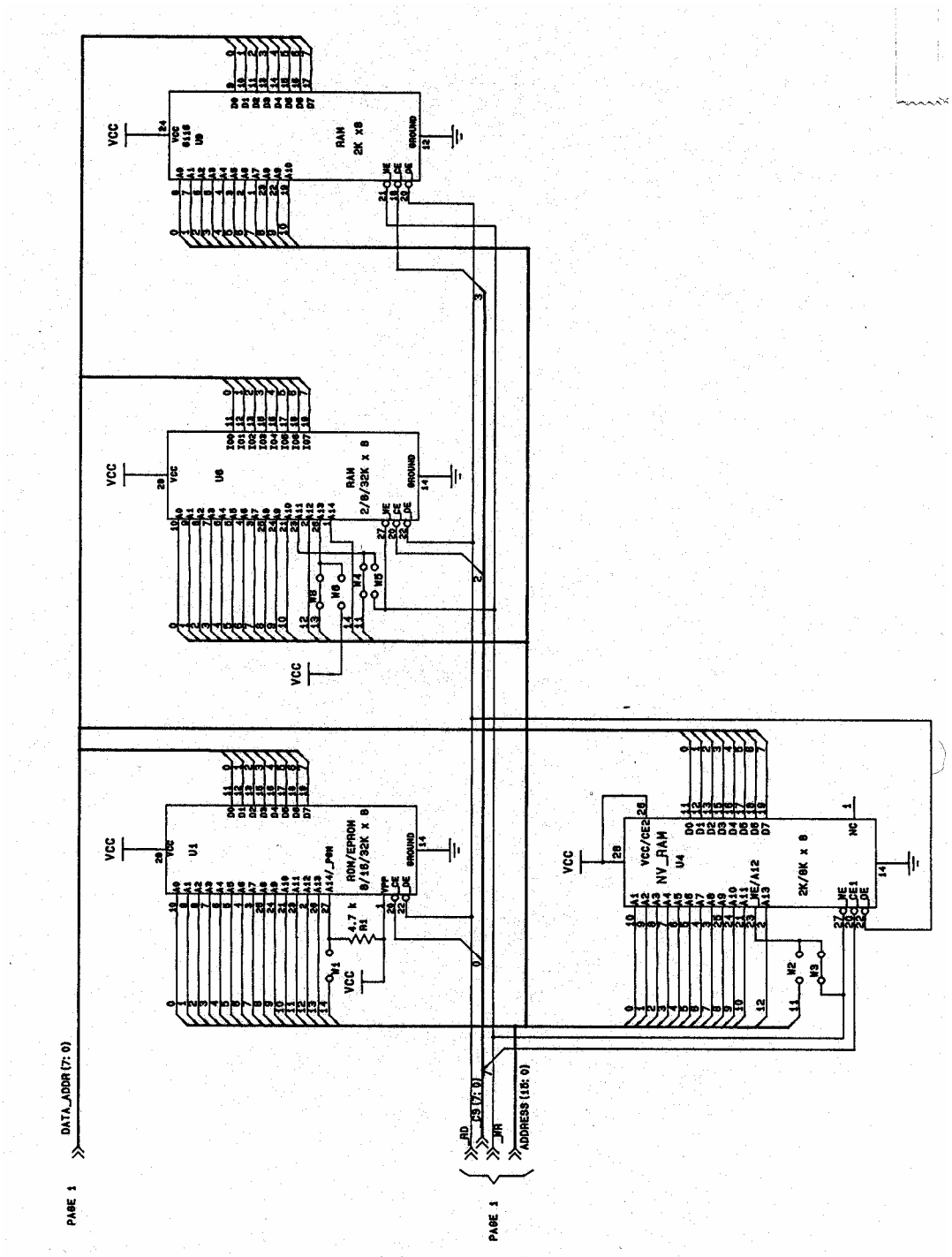
PROBLEM	POSSIBLE CAUSE
Paper-out detector fails to detect absence of paper	Excessive dirt or paper dust on sensor - clean with soft bristle brush or cotton swab Sensor dislodged from its mounting position
Paper-out condition is signaled when paper is not out	Backside of paper or form is too dark in color (too little light reflected into sensor) Buckle in form at perforation due to wrinkled or damaged form Sensor not plugged in at controller board Defective sensor Defective controller board
Paper will not thread properly when feeding from front	Paper has a downward curl at edge which prevents it from contacting the paper guide. Curling the paper upward should solve the problem. Paper feed slot is obstructed - clean out any debris
Printhead moves left when power is applied but no panel indicators illuminate. Reset button is inoperative	16-pin ribbon cable not plugged in at operator panel or controller board Broken or bent pin on above cable Cable plugged in backwards - check orientation on both ends Defective operator panel Defective controller board
Certain keys inoperative on operator panel or action occurs unrelated to key depressed. Display may not function properly	Broken or bent pin on 16-pin ribbon cable Connector not firmly seated (check both ends) One or more keys sticking Defective operator panel Defective controller board
Printer fails to enter Setup mode upon depression of Enter Setup key	Printer On line (must be in Off line) Printer is not idle (i.e., is printing or feeding paper)

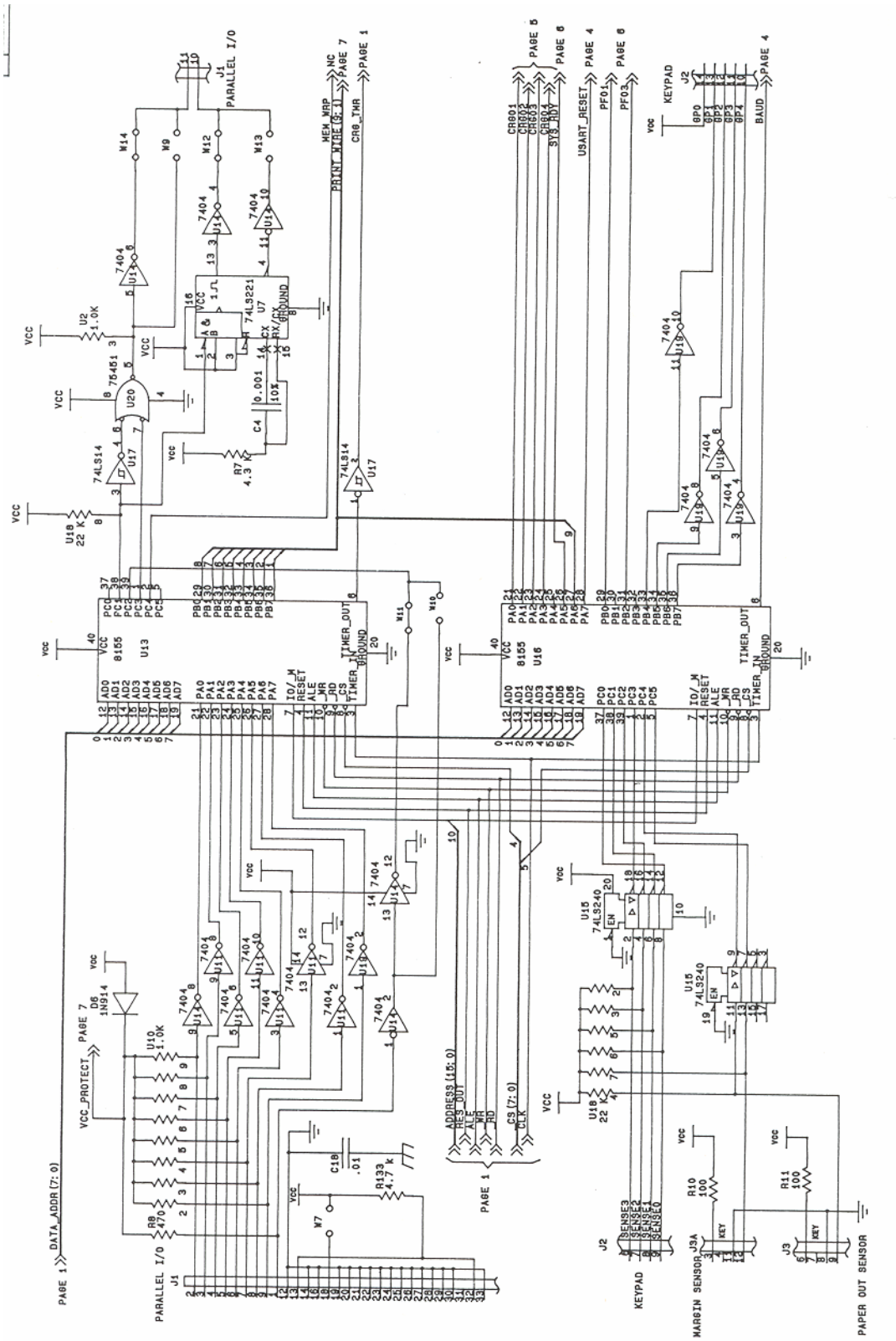
Table 3.1 Troubleshooting

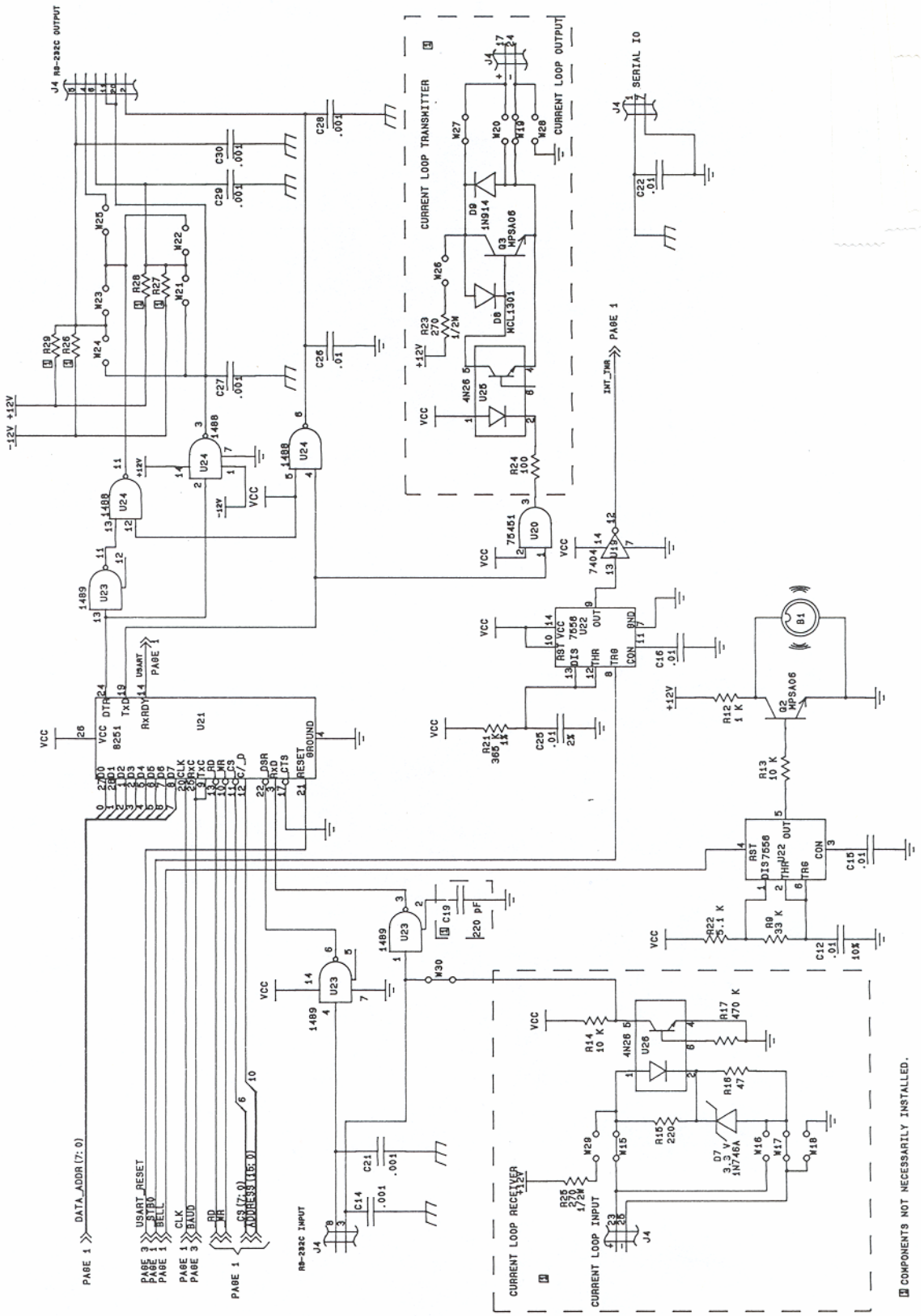
PROBLEM	POSSIBLE CAUSE
Paper-out detector fails to detect absence of paper	Excessive dirt or paper dust on sensor - clean with soft bristle brush or cotton swab Sensor dislodged from its mounting position
Paper-out condition is signaled when paper is not out	Backside of paper or form is too dark in color (too little light reflected into sensor) Buckle in form at perforation due to wrinkled or damaged form Sensor not plugged in at controller board Defective sensor Defective controller board
Paper will not thread properly when feeding from front	Paper has a downward curl at edge which prevents it from contacting the paper guide. Curling the paper upward should solve the problem. Paper feed slot is obstructed - clean out any debris
Printhead moves left when power is applied but no panel indicators illuminate. Reset button is inoperative	16-pin ribbon cable not plugged in at operator panel or controller board Broken or bent pin on above cable Cable plugged in backwards - check orientation on both ends Defective operator panel Defective controller board
Certain keys inoperative on operator panel or action occurs unrelated to key depressed. Display may not function properly	Broken or bent pin on 16-pin ribbon cable Connector not firmly seated (check both ends) One or more keys sticking Defective operator panel Defective controller board
Printer fails to enter Setup mode upon depression of Enter Setup key	Printer On line (must be in Off line) Printer is not idle (i.e., is printing or feeding paper)

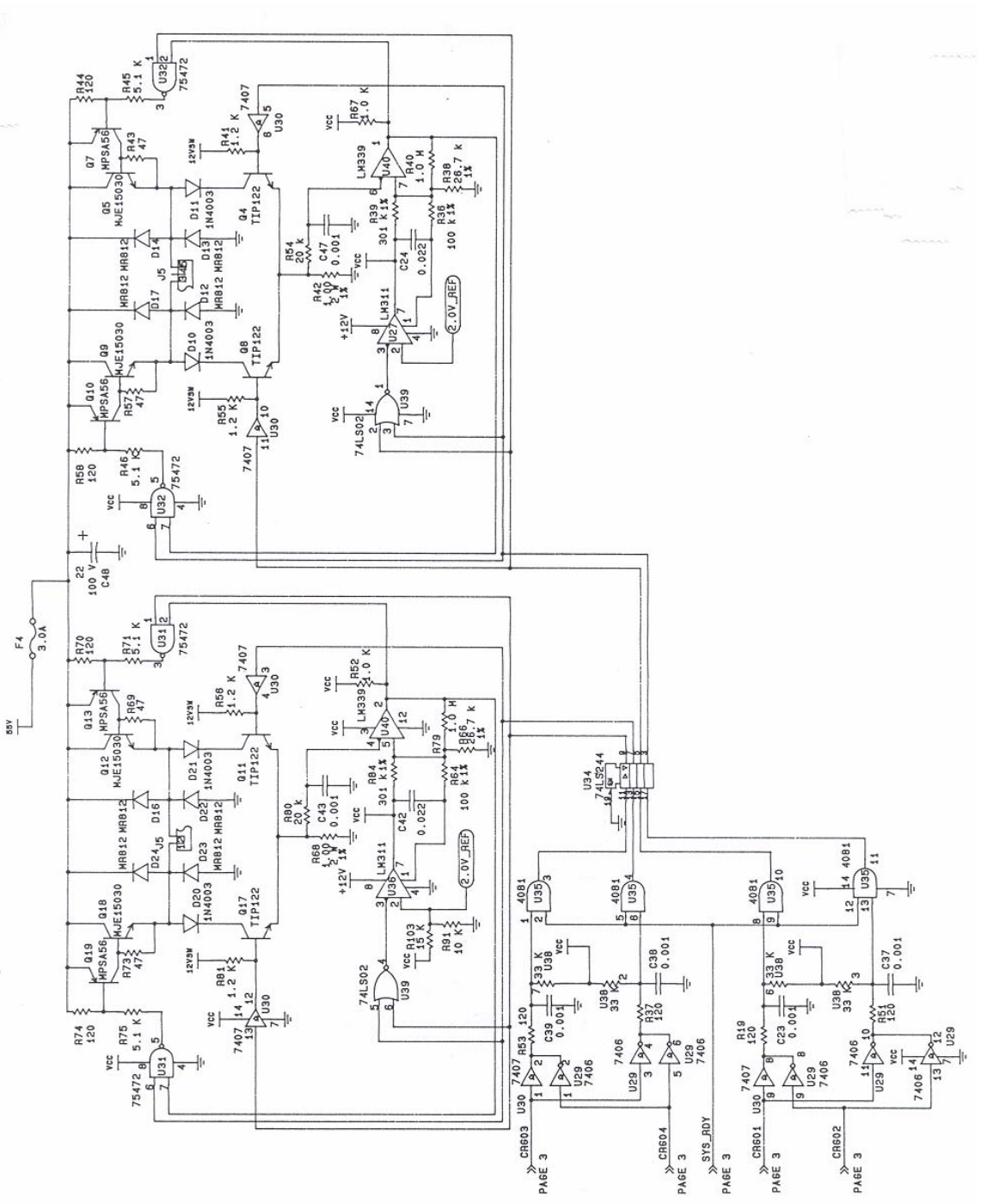
Figure 3.1: Controller Schematic
Part No. 105947 (Sheets 1 – 8)
PC Board 105601

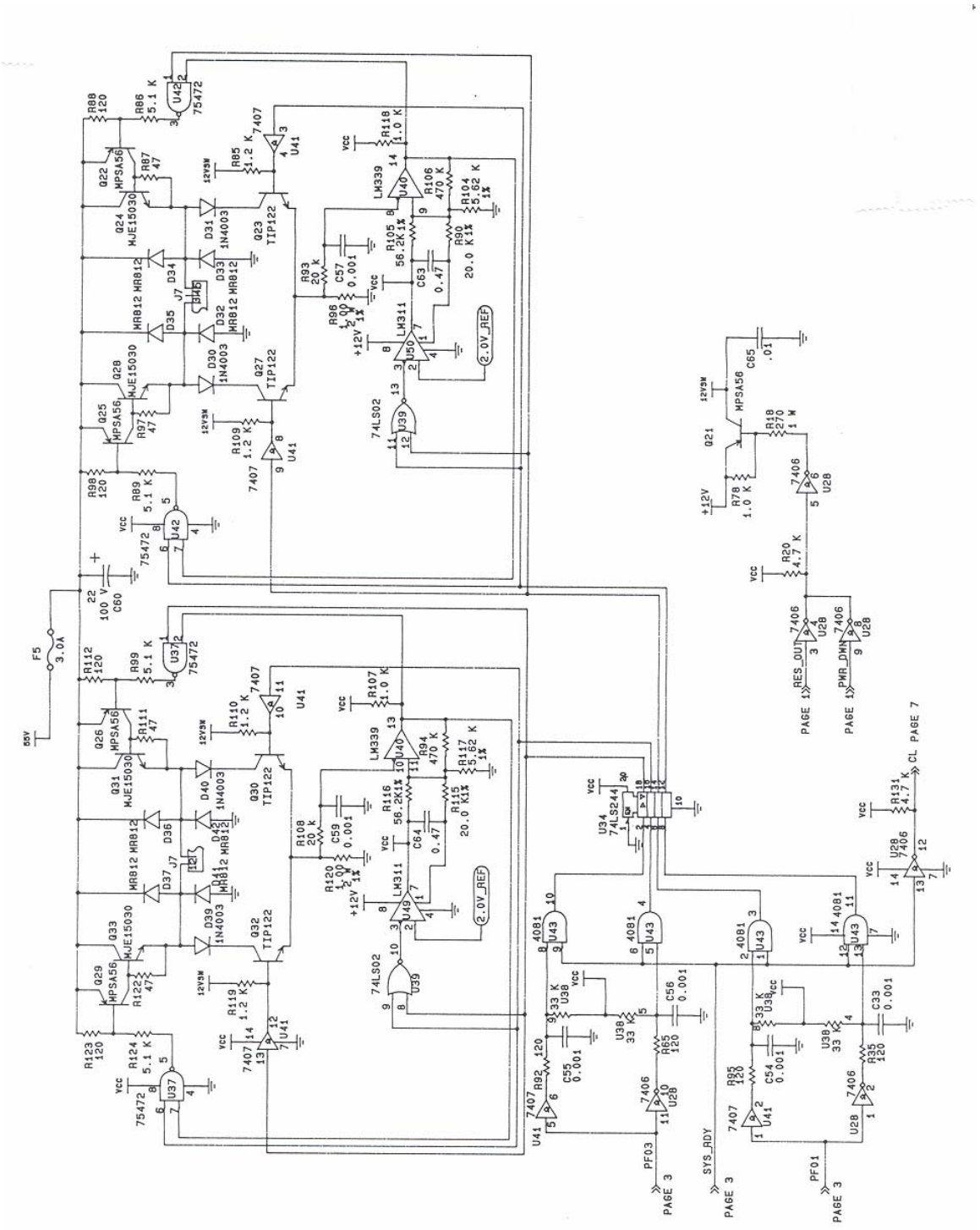

ADDRESS (15: 0)
DATA_ADDR (7: 0)
ADDRESS LATCH
I/O DECODER
MEMORY DECODER
KEYPAD
VCC
1N914
D1
4.7K
R3
1.0 k
R4
1.0K
U2
74LS373
U8
74LS139
U5
8085
U12
10.000 Mhz
Y1
33 K
R5
10UF
16 V
C7
74LS14
U17
D5
1N914
PAGE 2, 3, 4
PAGE 4
PAGE 7
PAGE 3, 4
PAGE 3, 6
PAGE 6
PAGE 8
PAGE 3
PAGE 4
PAGE 5
CS (7: 0)
RESET
PWR_DWN
CR0_THR
INT_THR
USART

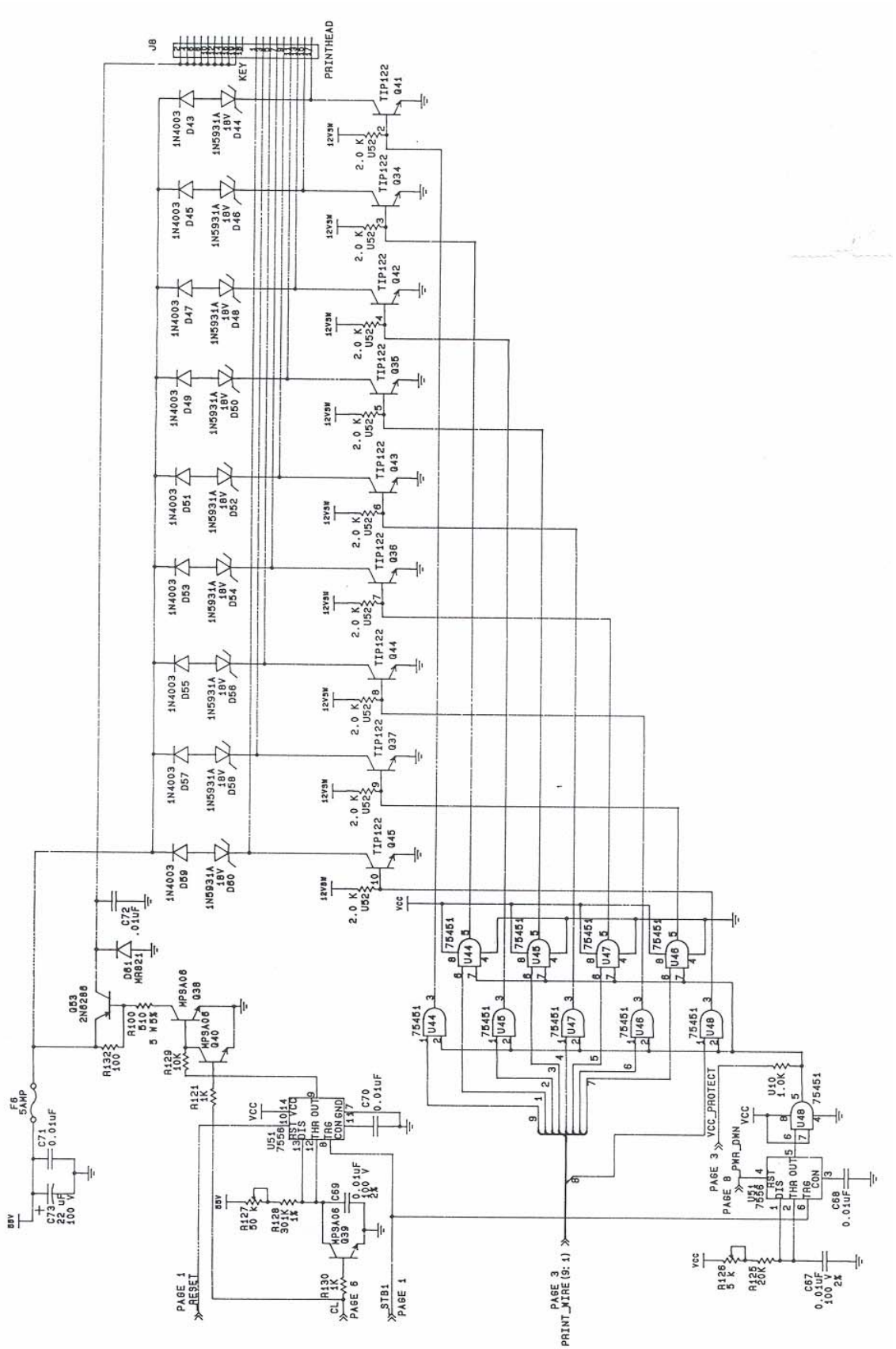

VCC
U0
RAM
2K x8
GROUND
U6
2/8/32K x 8
U1
ROM/EPROM
8/16/32K x 8
4.7 k
R1
U4
NV_RAM
2K/8K x 8
DATA_ADDR(7:0)
PAGE 1
RD
PS(7:0)
WR
ADDRESS(15:0)


J1
PARALLEL I/O
U13
8155
U16
8155
U20
75451
U7
74LS221
U17
74LS14
U15
74LS240
U18
22 K
U2
1.0K
U10
1.0K
R8
470
R133
4.7 k
R7
4.3 K
C4
0.001
10%
C18
.01
D6
1N914
7404
VCC
GROUND
TIMER_OUT
TIMER_IN
IO/M
RESET
ALE
WR
RD
CS
DATA_ADDR (7:0)
VCC_PROTECT
PAGE 1
PAGE 7
PAGE 6
PAGE 5
PAGE 4
PAGE 0
ADDRESS (15:0)
CS (7:0)
CLK
RES_OUT
MEM WRP
PRINT WIRE (5:1)
CR0_THR
CR0001
CR0002
CR0003
CR0004
STS_RDY
USART_RESET
PF01
PF03
KEYPAD
BAUD
J2
J3A
J3
R10
100
R11
100
KEY
SENSE3
SENSE2
SENSE1
SENSE0
MARGIN SENSOR
PAPER OUT SENSOR


J4 RS-232C OUTPUT
CURRENT LOOP TRANSMITTER
CURRENT LOOP OUTPUT
J4 SERIAL IO
INT_IN8
PAGE 1
USART
PAGE 1
U21
8251
RxRDY
TxD
DTR
VCC
GROUND
RESET
D0R
RXD
CTS
RD
WR
C/D
SYNC
TXC
TXRDY
TXE
RXC
RXRDY
SYNDET
BRKDET
FE
OE
PE
TXEMPTY
D0
D1
D2
D3
D4
D5
D6
D7
RxC
TxC
U20
75451
U19
7404
U22
DI3 7556
RST
THR
TRG
CON
OUT
GND
B1
Q2
MPSA06
Q3
MPSA06
D8
MCL1301
D9
1N914
U25
4N26
U26
4N26
D7
3.3 V
1N746A
U23
1489
U24
1488
R12
1 K
R13
10 K
R14
10 K
R15
220
R16
47
R17
470 K
R18
R21
365 K
R22
5.1 K
R23
270
1/2W
R24
100
R25
270
1/2W
R26
R27
R28
R29
R30
C12
.01
10%
C15
.01
C16
.01
C19
220 pF
C20
.001
C21
.001
C22
.01
C25
.01
25
C26
.01
C27
.001
C28
.001
C29
.001
C30
.001
DATA_ADDR(7:0)
USART_RESET
BTBD
BELL
CLK
BAUD
RD
WR
C/D
ADDRESS(15:0)
RS-232C INPUT
CURRENT LOOP RECEIVER
CURRENT LOOP INPUT
COMPONENTS NOT NECESSARILY INSTALLED.




5V
F5
3.0A
100 V
C60
+12V
VCC
2.0V_REF
LM339
LM311
74LS02
74LS244
7407
75472
7406
4081
MPSA56
MJE15030
TIP122
MRB12
1N4003
PF03
PF01
SYS_RDY
RES_OUT
PWR_DWN
CL PAGE 7
PAGE 3


J8
PRINTHEAD
KEY
TIP122 Q41
TIP122 Q34
TIP122 Q42
TIP122 Q35
TIP122 Q43
TIP122 Q36
TIP122 Q44
TIP122 Q37
TIP122 Q45
1N4003 D43
1N5931A 18V D44
1N4003 D45
1N5931A 18V D46
1N4003 D47
1N5931A 18V D48
1N4003 D49
1N5931A 18V D50
1N4003 D51
1N5931A 18V D52
1N4003 D53
1N5931A 18V D54
1N4003 D55
1N5931A 18V D56
1N4003 D57
1N5931A 18V D58
1N4003 D59
1N5931A 18V D60
12VSW
2.0 K U52
VCC
75451 U44
75451 U45
75451 U47
75451 U46
75451 U48
U10 1.0K
VCC_PROTECT
PAGE 3
PAGE 8
PWR_DWN
U51 7556
RST
DIS
THR OUT
TRG
CON
C68 0.01UF
R126 20K
R128 5 K
C67 0.01UF 100 V 2%
VCC
F6 5AMP
C71 0.01uF
C73 22 uF 100 V
C72 .01UF
D61 MR821
Q53 2N6288
R100 5.1Ω 5 W 5%
R132 100
Q38 MP8A06
Q40 MP8A06
R129 10K
R121 1K
C70 0.01uF
U51 7556
RST VCC
DIS
THR OUT
TRG
CON GND
R127 50 K
R128 301K 1%
C69 0.01uF 100 V 2%
Q39 MP8A06
R130 1K
CL
PAGE 6
PAGE 1
RESET
STB1
PAGE 1
PRINT_WIRE(9:1)
PAGE 3

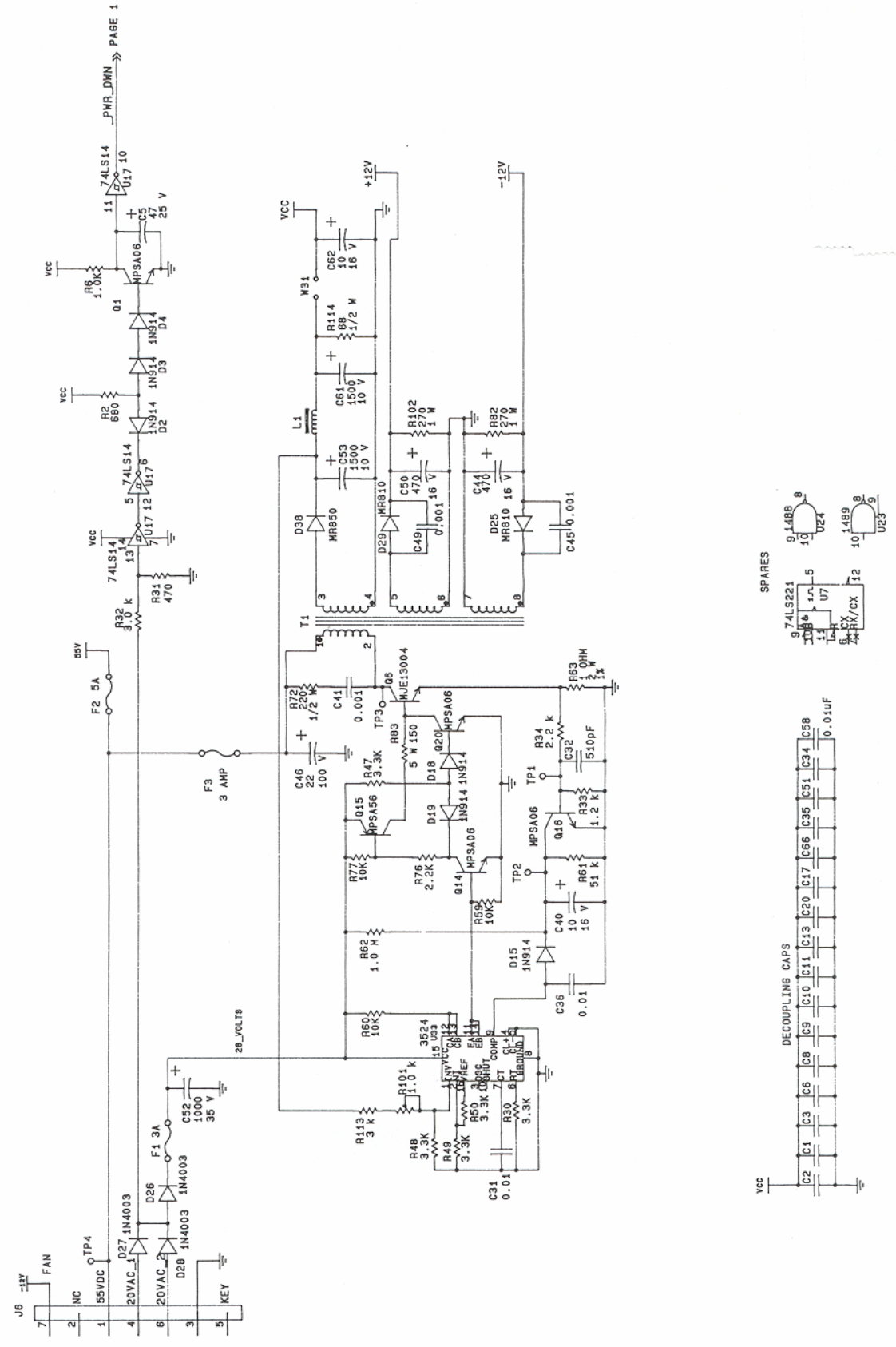
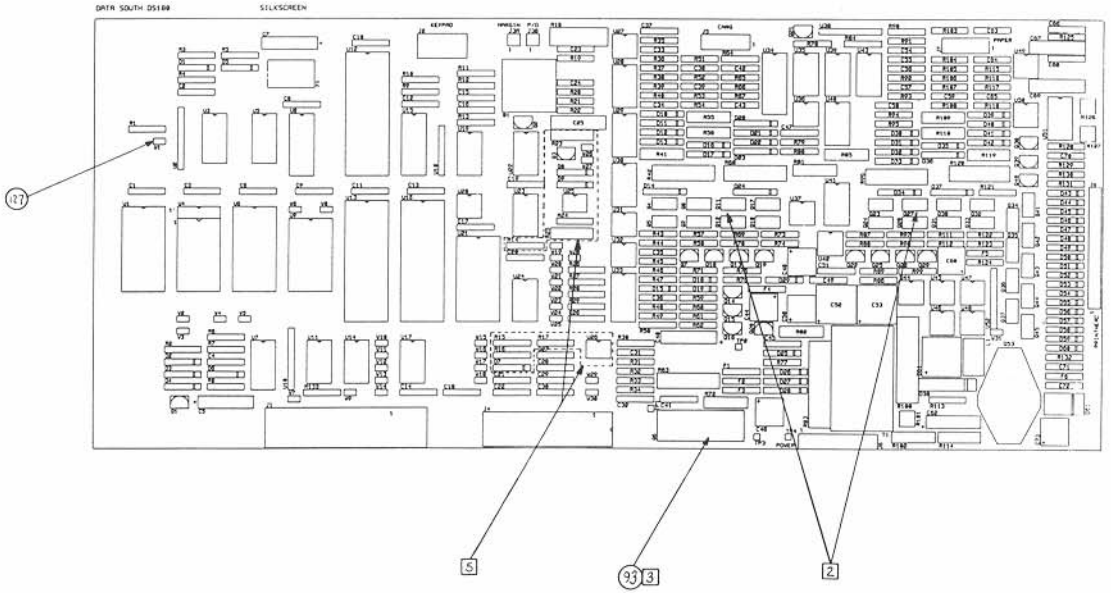

PWR_DWN
PAGE 1
74LS14
MPSA06
1N914
1N4003
MR850
MR810
MJE13004
3524
SPARES
74LS221
DECOUPLING CAPS
J6
FAN
NC
55VDC
20VAC_1
20VAC_2
KEY
28_VOLTS
+12V
-12V
VCC

Figure 3.2: Controller Finished Assembly
Component Layout
Part No. 105535 (Sheets 1 and 2)
PC Board 105601



NOTES:

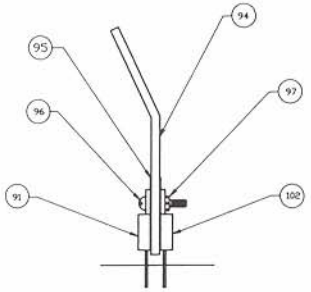
1) REFER TO SHEET 2 FOR BOM

[2] ASSEMBLE VERTICAL HEATSINK (ITEM 94) ONTO BOARD USING INSULATOR PADS (ITEM 95), SCREWS (ITEM 96), AND NUTS (ITEM 97) AS SHOWN IN DETAIL A.

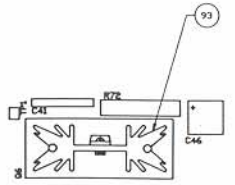
[3] ASSEMBLE SINGLE HEATSINK ASSEMBLY (ITEM 93) ONTO BOARD AS SHOWN IN DETAIL B.

4) ASSEMBLE TO-3 HEATSINK ASSEMBLY (ITEM 92) ONTO BOARD IN LOCATION Q-53.

[5] COMPONENTS ARE INSTALLED IN THE -2 CONFIGURATION ONLY.



DETAIL A
TYPICAL 2 PLACES
SCALE: NONE



DETAIL B
SCALE: NONE

BILL OF MATERIAL		CONFIGURATION				
		105535-1	105535-2	105535-3	105535-4	
ITEM	PART NO	DESCRIPTION	QTY	QTY	QTY	QTY	REF DESIGNATOR [3]
1	CAC-100102	RESIST, 33K 1/4W CF 5%	6	6	4	6	(R) 5,9,27,29, (26,28)
2	CAC-100089	RESIST, 100 OHM 1/4W CF 5%	3	4	3	3	(R) 10,11,132 (R24)
3	CAC-100088	RESIST, 47 OHM 1/4W CF 5%	8	9	8	8	(R) 43,57,63,73, 87,97,111,122 (R18)
4	CAC-100090	RESIST, 120 OHM 1/4W CF 5%	16	16	16	16	(R) 1,2,3,4,6,7,8,15,16,45, 52,53,54,55,56,58,62,63
5	CAC-100097	RESIST, 5.1K 1/4W CF 5%	9	9	9	9	(R) 117,45,46,75, 76,83,93,124
6	CAC-100135	RESIST, 30K 1/4W CF 5%	1	1	1	0	(R) 125
7	CAC-100104	RESIST, 330K 1/4W CF 5%	1	1	1	0	(R) 128
8	CAC-100093	RESIST, 1K 1/4W CF 5%	10	10	10	10	(R) 4,9,30,36,47,78 107,108,109,130
9	CAC-100098	RESIST, 10K 1/4W CF 5%	6	7	6	6	(R)13,39,66,77,91,129 (R14)
10	CAC-100100	RESIST, 20K 1/4W CF 5%	4	4	4	5	(R) 34,86,93,108 (R125)
11	CAC-101047	RESIST, 3.62 K 1% 1/4W	2	2	2	2	(R) 104,117
12	CAC-101115	RESIST, 680 OHM 1/4W 5%	1	1	1	1	(R) 2
13	CAC-100092	RESIST, 470 OHM 1/4W CF 5%	2	2	2	2	(R) 8,31
14	CAC-100132	RESIST, 100 K 1/4W 1%	2	2	2	2	(R) 36,64
15	CAC-100096	RESIST, 3.3K 1/4W 5%	5	5	5	5	(R) 30,47-50
16	CAC-100095	RESIST, 3K 1/4W CF 5%	2	2	2	2	(R) 32,113
17	CAC-100099	RESIST, 15K 1/4W CF 5%	1	1	1	1	(R) 103
18	CAC-100105	RESIST, 1M 1/4W CF 5%	3	3	3	3	(R) 40,62,79
19	CAC-100094	RESIST, 2.2K 1/4W CF 5%	2	2	2	2	(R) 34,76
20	CAC-101043	RESIST, 12K 1/4W CF 5%	9	9	9	9	(R) 33,41,55,56,81, 85,109,110,119
21	CAC-101300	RESIST, 56.2K 1/4W 1%	2	2	2	2	(R) 105,116
22	CAC-102041	RESIST, 4.7K 1/4W 5%	5	5	5	4	(R) 3,20,131,133, (R1)
23	CAC-100902	RESIST, 4.2K 1/4W CF 5%	1	1	1	1	(R) 7
24	CAC-100109	RESIST, 365K 1/4W MF 1%	1	1	1	1	(R) 21
25	CAC-102449	RESIST, 51k 1/4W 5%	1	1	1	1	(R) 61
26	CAC-100110	RESIST, 68 OHM 1/2W CF 5%	1	1	1	1	(R) 114
27	CAC-100111	RESIST, 220 OHM 1/2W CF 5%	1	1	1	1	(R) 72
28	CAC-100114	RESIST, 1 OHM 2W WW 1%	5	5	5	5	(R) 42,63,68,96,120
29	CAC-100112	RESIST, 270 OHM 1W WW 5%	3	3	3	3	(R) 18,82,102
30	CAD-100043	CAP, FILM .01mF 2%	3	3	3	3	(C) 25,67,69
31	CAD-101048	CAP, ELEC AX 10mF 16V	3	3	3	3	(C) 7,48,62
32	CAD-101053	CAP, CER-AX 510pF 50V 10%	1	1	1	1	(C) 32
33	CAC-102451	RESIST, 26.7K 1/4W 1%	2	2	2	2	(R) 38,66
34	CAC-103385	RESIST, NET SIP 33K 9 PIN	1	1	1	1	(U) 38
35	CAD-105348	CAP, ELEC 1000mF 50V	1	1	1	1	(C) 52
36	CAD-101052	CAP, CER-AX .001mF 50V 10%	22	22	22	22	(C) 4,14,23,27-30 33,37-39,41,43 45,47,49,54-57,59
37	CAC-103400	RESIST, 301K 1/4W 1%	2	2	2	3	(R) 39,84 (R128)
38	CAC-100122	RESIST, 470K 1/4W 5%	2	3	2	2	(R) 94,106 (R17)
39	CAH-100070	DIODE, SIGNAL 1N914	9	10	9	9	(D) 1-6,15,119 (D9)
40	CAH-100577	DIODE, POWER MRB12	16	16	16	16	(D) 12-14,17,28-34, 36-37,41,42
41	CAC-105508	RESIST, 20K 1/4W 1%	2	2	2	2	(R) 96,115
42	CAH-100073	DIODE, POWER MRB10	2	2	2	2	(D) 25,29
43	CAH-100067	DIODE, POWER 1N4003	20	20	20	20	(D) 10,11,26,35,38,39, 40,44,50,51,53,60, 61,64,65,70,71,74,75
44	CAD-102141	CAP, CER 0.01 MF 100V 10%	29	29	29	29	(C) 1-3,6,8,9-13,15-18,20, 22,24,31,34-36,51,58, 61,64,68,70-72
45	CAD-103738	CAP, 0.47 MF CC AX 25U	2	2	2	2	(C) 63,64
46	CAH-100069	DIODE, ZENER 1N4739A	9	9	9	0	(D) 44,45,48,50,52 54,56,58,60
47	CAN-105491-7	PICAFUSE, 3 AMP	2	2	2	2	(F) 2,6
48	CAN-105491-5	PICAFUSE, 3 AMP	4	4	4	4	(F) 1,3-5
49	CAD-105665	CAP, ELECT-AX 47MF 10V	1	1	1	1	(C) 5
50	CAD-103285	CAP, 0.022 MF	2	2	2	2	(C) 24,42
51	CAC-100014	BUFFER, 75451	6	6	6	6	(U) 20,44-48
52	CAC-100024	IC-LM339	1	1	1	1	(U) 40
53	CAC-100025	IC-4081	2	2	2	2	(U) 35,43
54	CAC-100700	IC-74LS244	1	1	1	1	(U) 34
55	CAC-100705	IC-74LS02	1	1	1	1	(U) 33
56	CAC-101131	IC-LM311	4	4	4	4	(U) 27,36,49,50
57	CAC-101540	IC-7407	2	2	2	2	(U) 30,41
58	CAC-101984	IC-75472	4	4	4	4	(U) 31,32,37,42
59	CAB-101917	SHIELDED, RCEP RA 25 POS	1	1	1	1	(J) 4
60	CAB-105537-5	HEADER, VERT LOCKING 1X5 .156	2	2	2	2	(J) 5,7
61	CAB-100151	HEADER, 1X19	1	1	1	1	(J) 8
62	CAS-100155	SOCKET, 40 PIN	3	3	3	3	(U) 12,13,16
63	CAS-100154	SOCKET, 28 PIN	3	3	3	3	(U) 14,21
64	BAU-100282	SPACER, NYLON	2	2	2	0	SEE SHEET 1 OF 2
65	CAB-101638	SHIELDED HEADER RA-2X18	1	1	1	1	(J) 1
66	CAB-100150	HEADER, VERT 2X2	2	2	2	2	(J) 4A, 4B

			CONFIGURATION				
			105535-1	105535-2	105535-3	105535-4	
ITEM	PART NO	DESCRIPTION	QTY	QTY	QTY	QTY	REF DESIGNATOR [3]
67	CAA-105601	PCB, CONTROL DS180 VDE FAB	1	1	1	1	SEE SHEET 1 OF 1
68	CAC-101090	IC-74LS240	1	1	1	1	(U) 15
69	CAC-100091	IC-74LS373	1	1	1	1	(U) 8
70	CAC-100005	GATE TTL 74LS138 PC	1	1	1	1	(U) 5
71							
72	CAC-100018	GATE TTL 7404 PC	3	3	3	3	(U) 11,14,19
73	CAC-100031	IC-SN74LS221N	1	1	1	1	(U) 7
74	CAC-100029	IC-74LS14N	1	1	1	1	(U) 17
75	CAC-100008	INTERFACE MC1489P	1	1	1	1	(U) 23
76	CAC-100007	INTERFACE MC1488P	1	1	1	1	(U) 24
77	CAC-100015	PULSE WIDTH MOD-LM3524N	1	1	1	1	(U) 33
78	CAE-100017	DUAL TIMER-IDM 75561PD	2	2	2	2	(U) 22,31
79	CAC-100903	RESIST, 510 5W WW 5%	1	1	1	1	(R) 100
80	CAC-100113	RESIST, 150 OHM 5W WW 5%	1	1	1	1	(R) 83
81	CAJ-105653-7	POTENTIOMETER, 1K	1	1	1	1	(R) 101
82	CAJ-105653-9	POTENTIOMETER, 5K	1	1	1	1	(R) 126
83	CAJ-105653-12	POTENTIOMETER, 50K	1	1	1	1	(R) 127
84	CAD-100046	CAP, ELEC 22 MF 100V	4	4	4	4	(C) 46,48,60,73
85	CAD-100047	CAP, ELEC 470 MF 16V	2	2	2	2	(C) 44,50
86	CAD-100049	CAP, ELEC 1500 MF 10V	2	2	2	2	(C) 53,61
87	CAH-100071	DIODE, POWER MR821	1	1	1	1	(D) 61
88	CAH-100072	DIODE, POWER MR830	1	1	1	1	(D) 38
89	CAI-100081	TRANS, SIG MPSA06	8	9	8	8	(Q) 1,2,3,4,6,7,8,39-48 (Q33
90	CAI-100083	TRANS, SIG MPSA56	10	10	10	10	(Q) 9,10,11,12,13,14,15,16, 17,18,19,20,21,22,23,24,25
91	CAI-101109	TRANS, POWER TIP132	17	17	17	17	(Q) 5,26,27,28,29,30,31,32, 33,34-37,41-43
92	AAB-101138	TO-3 HTSINK ASSY 2N6286	1	1	1	1	(Q) 53
93	AAB-100477	SINGLE HEATSINK ASSY	1	1	1	1	SEE SHEET 1 OF 2
94	CAV-103543	HEATSINK, VERTICAL	2	2	2	2	SEE SHEET 1 OF 2
95	CAV-103552	INSUL, VERTICAL SINK	4	4	4	4	SEE SHEET 1 OF 2
96	BAN-101084	SCREW, NYLON #4-40 X 1/2	8	8	8	8	SEE SHEET 1 OF 2
97	BAN-100239	NUT, HEX HEAD #4-40 KEP	8	8	8	8	SEE SHEET 1 OF 2
98	CAQ-100188	CRYSTAL, 6.144 MHZ	1	1	1	0	(Y) 1
99	CAF-100593	TRANS, POWER CONVERTER	1	1	1	1	(T) 1
100	AAB-100475	TOROID CHOKE SUB-ASSY	1	1	1	1	(L) 1
101	CAS-100161	SOCKET, 24 PIN	2	2	2	1	(U) 4 (U6)
102	CAI-100079	TRANS, POWER MJE15030	8	8	8	8	(Q) 5,9,12,18,24,28,31,33
103	CAC-100908	SIP, PULL-UP 1K OHM 10 PIN	2	2	2	2	(U) 2,10
104	CAB-103734	HEADER, 2 PIN	2	2	2	2	(W) 3, 7
105	CAB-103735	SHUNT, POST	1	1	1	1	(W) 31
106	CAC-105678	NETWORK, SIP, 2K OHMS	1	1	1	1	(U) 52
107	CAC-100059	RESIST, NET-SIP 22K 8 PIN	1	1	1	1	(U) 18
108	CAB-101530	HEADER, VERT 1X7	1	1	1	1	(J) 6
109	CAB-100914	HEADER, VERT 2X8	1	1	1	1	(J) 2
110	CAE-101904	RAM, STATIC 8K X 8	1	1	1	0	(U) 6
111	CAE-101026	MPU 8085A-2 HI SPEED 5MHZ	1	1	1	1	(U) 12
112	CAE-102487	RAM, 2K X 8 250NS	1	1	1	0	(U) 9
113	CAE-100011	TIMER, IDRAM P8155	2	2	2	0	(U) 13,16
114	CAE-100012	USART P8251A	1	1	1	0	(U) 21
115	CAD-100917	ALARM PIEZO PKM	1	1	1	1	BELL
116	CAE-102349	RAM, CMOS 2K X 8 ZERO POWER	1	1	1	1	(U) 4
117	AFV-105270	DS-180 CONT PROG PROM	1	1	1	0	(U) 3
118	AFV-105950	XL 300 CONT PROG PROM	0	0	0	1	(U) 3
119	CAS-100145	SOCKET, 16 PIN	1	1	1	1	(U) 3
120	CAC-102038	IC-7406	2	2	2	2	(U) 28,29
121	CAC-100134	RESIST, 270 OHM .50 W CF 5%	0	2	0	0	(R 23,25)
122	CAH-100076	DIODE, LIMIT- MCL1301	0	1	0	0	(D 8)
123	CAC-100091	RESIST, 220 OHM .25 W CF 5%	0	1	0	0	(R 153)
124	CAG-100020	PHOTO TX-4N26	0	2	0	0	(U 25,26)
125	CAH-100066	DIODE, ZENER 1N914	0	1	0	0	(D 7)
126	CAN-105491-3	PICOFUSE, 1 AMP	0	0	2	0	(D 26, 28)
127	CAR-100975	WIRE, JUMPER	0	0	0	25"	(W) 13
128	CAQ-100916	CRYSTAL, 10.0 MHz	0	0	0	1	(Y) 13
129	CAC-103436	RAM, STATIC 32K X 8 150 NS	0	0	0	1	(U) 6)
130	CAE-100011-1	TIMER, IDRAM P8155-2 HI SPD 5 MHz	0	0	0	2	(U) 13,16
131	CAE-100012-1	USART P8251A	0	0	0	1	(U) 21
132	CAH-105944	DIODE, ZENER 1N5933A	0	0	0	9	(D) 44,46,48,50,52,54,56,58,60
133							

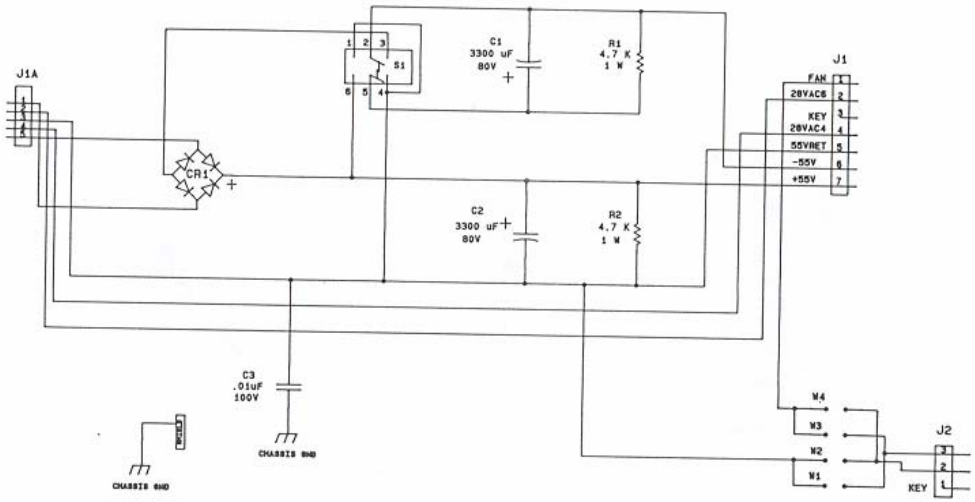
NOTES:

1) SEE SHEET 1 OF 2 FOR ACTUAL LOCATION OF CHART ITEMS LISTED ABOVE
2) REFERENCE DOCUMENT: AAI-105670 SCHEMATIC, DS-180 + V (CONFIG'S -1,-2,-3)
   AAI-105947 SCHEMATIC, XL 300 (CONFIGURATION -4)

[3] ITEMS UNDER REFERENCE DESIGNATOR IN BRACKETS [ ] ARE USED FOR SPECIFIC CONFIGURATIONS

4) AAB-105535-3 IS FOR THE SMART BUFFER PCB CONTROLLER ASSEMBLY
5) AAB-105535-4 IS FOR THE XL 300 PCB CONTROLLER ASSEMBLY
6) THE CONFIGURATIONS -1 THROUGH -3 ARE MAINTAINED FOR SERVICE ON PRODUCTS PRIOR TO XL

Figure 3.3: Power Supply PCB Schematic
Part No. 105623
PC Board 105622



NOTES:

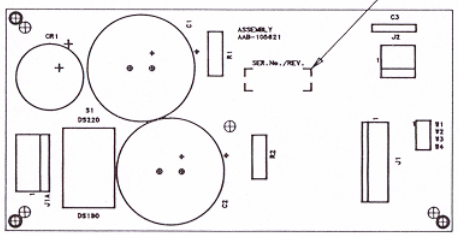
1) UNLESS SPECIFIED OTHERWISE ALL RESISTORS ARE 1/4W 5%.
2) UNLESS SPECIFIED OTHERWISE ALL CAPACITORS ARE IN uF.
3) A LEADING "_" DESIGNATES AN ACTIVE LOW SIGNAL.

Figure 3.4: Power Supply PCB Assembly
Part No. 105621
PC Board 105622

BILL OF MATERIALS

REMARKES	ITEM	PART NO.	QTY	DESCRIPTION	REFERENCE
1	1	CAA-105622	1	PCB, UNIVERSAL POWER SUPPLY	
	2	CAB-105537-5	1	CONNECTOR, 1X5 PIN LOCKING	J1A
	3	CAB-105537-3	1	CONNECTOR, 1X3 PIN LOCKING	J2
	4	CAB-101279	1	HEADER, VERT. 2X4 PIN	(W4 W3 W2 W1)
	5	CAB-101530	1	HEADER, VERT. 1X7	J1
	6	CAC-100106	2	RES, 4.7K, 5%, 1 W	R2 R1
	7	CAD-101889	2	CAP, ELEC,RADIAL, 3300uf, 20%, 80V	C2 C1
	8	CAD-102141	1	CAP, CER-AX, .01uf, 10%, 100V	C3
2	9	BAR-103663	1	LABEL, S/N, PRINTED	
	10	CAL-101287	1	RECTIFIER, BRIDGE	CR1
	11	CAV-101579	1	SWITCH, 5 AMP PWR SUPPLY	S1
	12	AAI-105623	REF	SCHEMATIC, ELECTRICAL	

NOTE - THIS AREA SHALL BE RESERVED FOR SERIAL NUMBER / REVISION LABEL (SEE NOTE 3).

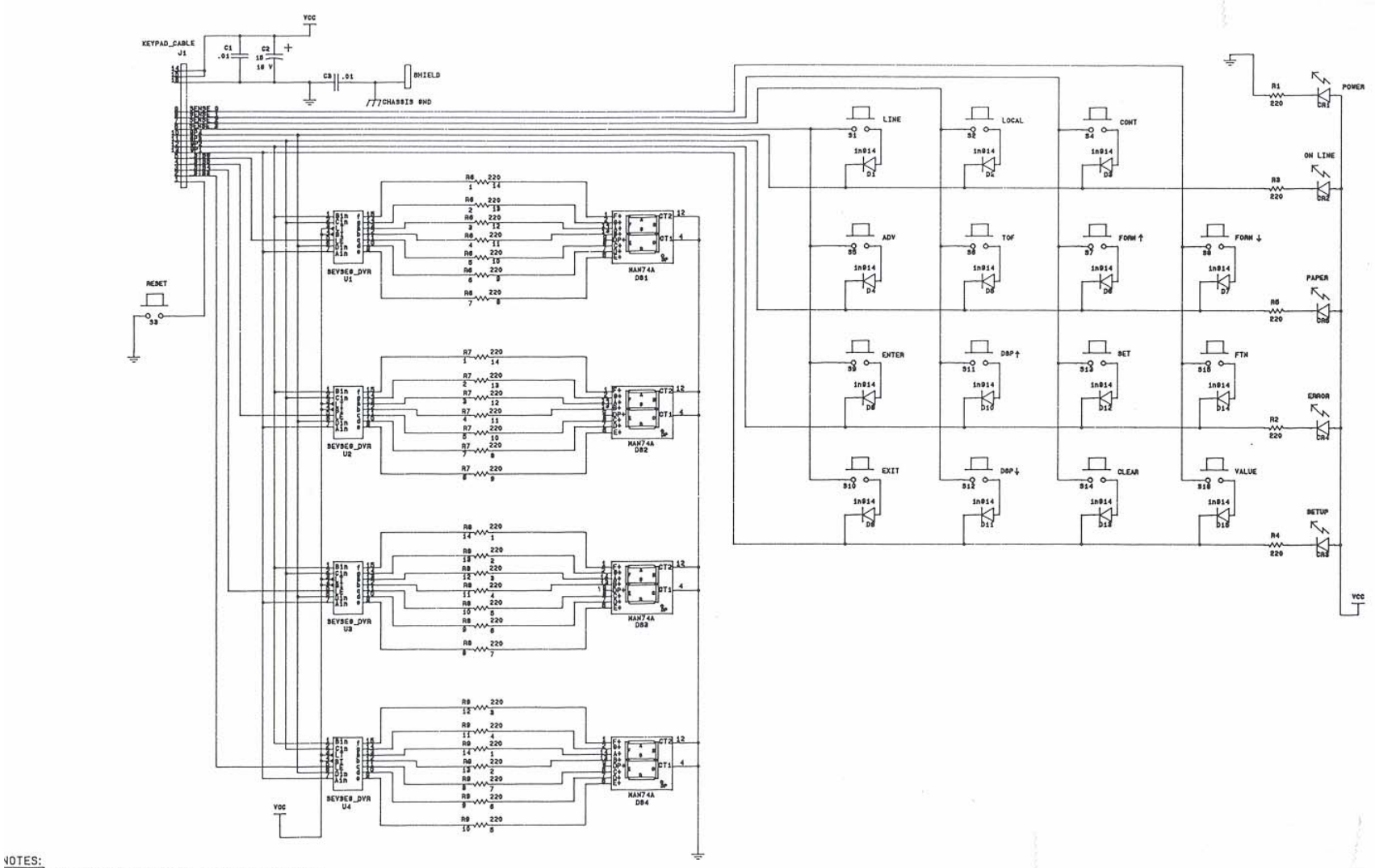


NOTES -

UNLESS OTHERWISE SPECIFIED :

1. MAKE ASSEMBLY FROM ITEM 1 - P/N CAA-105622.
2. RESISTORS ARE IN OHMS
   CAPACITORS ARE IN uf
   INDUCTORS ARE IN mH
3. APPLY S/N LABEL (ITEM 9) TO DESIGNATED AREA ON PRINTED CIRCUIT BOARD, WHERE SHOWN, AFTER WAVE SOLDERING.

Figure 3.5: Operator Panel PCB Schematics
Part No. 105815
PC Board 105800



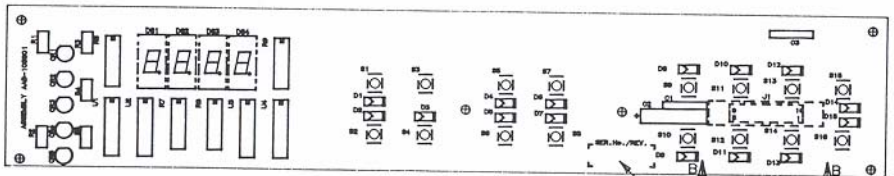
NOTES:

1) UNLESS SPECIFIED OTHERWISE ALL RESISTORS ARE 1/4W 5%.
2) UNLESS SPECIFIED OTHERWISE ALL CAPACITORS ARE IN uf.
3) A LEADING "_" DESIGNATES AN ACTIVE LOW SIGNAL.

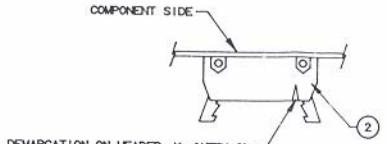
Figure 3.6: Operator Panel PCB Assembly
Part No. 105801
PC Board 105800

BILL OF MATERIALS

REMARKS	ITEM	PART NO.	QTY	DESCRIPTION	REFERENCE
△A	1	CAA-105800-1	1	PCB, KEYPAD	
△A	2	CAB-103280-1	1	HEADER, 2X8 VERT. LOCKING	J1
	3	CAC-100058	4	RES. NETWORK-DIP 220, 5%, 1/4 W	R9 R8 R7 R6
	4	CAC-100091	5	RES, 220, 5%, 1/4 W	R5 R4 R3 R2 R1
	5	CAD-100993	1	CAP, ELEC, AXIAL, 15uf 20% 16V	C2
	6	CAD-102141	2	CAP, AX. CER. 0.01uf 20% 100V	C3 C1
	7	CAE-100002	4	DRIVER, DISPLAY	U4 U3 U2 U1
	8	CAG-105529-2	4	DISPLAY, 7 SEG-MAN74A	DS4 DS3 DS2 DS1
	9	CAG-105477-1	5	DIODE, LITE EMITTING	CR5 CR4 CR3 CR2 CR1
	10	CAH-100070	15	DIODE, 1N914	D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1
	11	CAV-105803	16	SWITCH, SPST 50VAC WHT	S16 S15 S14 S13 S12 S11 S10 S9 S8 S7 S6 S5 S4 S3 S2 S1
	12				
	13				
	14	AA1-105815	REF	SCHEMATIC, KEYPAD	



THIS AREA SHALL BE RESERVED FOR SERIAL NUMBER / REVISION LABEL (SEE NOTE 4).



DETAIL VIEW B-B
SCALE = 1:1

NOTES :

UNLESS OTHERWISE SPECIFIED

△ 1. MAKE ASSEMBLY FROM ITEM 1 - P/N CAA-105800.
2. RESISTORS ARE IN OHMS.
CAPACITORS ARE IN uf.
△ 3. THE FOLLOWING ITEMS SHALL NOT BE ASSEMBLED TO PC BOARD PRIOR TO WAVE SOLDERING :
HEADER - J1 (ITEM 2)

4. APPLY S/N LABEL, NOT SHOWN, TO PRINTED CIRCUIT BOARD, WHERE SHOWN, AFTER WAVE SOLDERING.

Chapter 4: MAINTENANCE

4.1: INTRODUCTION

This chapter provides the technician with scheduled maintenance, corrective maintenance and adjustment and alignment procedures needed to service the printer.

4.2: Recommended Tools and Materials

Only a small number of tools are required to perform the maintenance and alignment procedures provided in this chapter. A list of all tools and materials the technician should have available in order to service a printer is given below.

Standard tip screwdriver, round shank (min. 10" length), 5/16" bit
#1 Phillips screwdriver, 4 inch shank
#2 Phillips screwdriver, 6 inch shank
Assortment of Allen
(Hex) wrenches
Torque wrench capable of delivering a torque of 115 inch- pounds with a 7/16 inch socket
0.010 inch flat feeler gage
Common slip-joint pliers
Small bristle brush
Soft, clean cloths
General purpose cleaner (ie, Formula 409, Fantastik, etc.)
Isopropyl alcohol
Spring hook (useful but not required)
5/16" open-end wrench Force gage
Diagonal cutters

4.3: Recommended Spare Parts

The following printer components are suggested for a replacement parts inventory:

*Printhead assembly
*Operator panel assembly
*Controller board
Set of carriage drive cables
*16-conductor ribbon cable (for operator panel)
Printhead cable
Ribbon advance mechanism
Paper advance drive motor
Carriage drive motor

A complete back-up machine for the first 1-25 units installed is recommended beyond the initial 25 units, recommended quantities of spares are as follows:

Table 4.1 Recommended Quantities of Spares	
Controller board	1 spare per 25 units installed
Operator panel	1 spare per 35 units installed
Printhead	1 spare per 35 units installed
Moving mechanical parts	1 spare per 50 units installed
Paper advance motor	1 spare per 200 units installed
Carriage drive motor	1 spare per 200 units installed

4.4: Scheduled Maintenance

WARNING
Make certain printer is disconnected from A.C. power supply before reaching into the printer to perform any cleaning task.

CAUTION
Do not use any cleaners, solvents, or lubricants on any of the working parts of the printer.

The only scheduled maintenance which can be performed is periodic cleaning (approximately every 3 months). Use a vacuum cleaner with a plastic nozzle to remove dirt from the carriage and the platen. A dry, lint-free cloth may be used to clean accumulated dirt from the carriage rods and the platen. The top cover of the printer may be cleaned with a commercial cleaner such as 409. Clean the access window with a soft non-abrasive cloth. Do not use paper to clean the access window.

4.4.1: Printhead

The printhead should be removed and cleaned approximately every 4-6 months depending on usage. Deterioration of print quality between scheduled cleanings would indicate a need for more frequent cleaning. To remove and clean the printhead proceed as follows:

1. Remove top cover (see Paragraph 4.5.1).

2. Remove printhead (see Paragraph 4.5.24).

3. After removing the printhead and bracket assembly from the carriage, clean the head using a small hard-bristle brush and isopropyl alcohol. Only the printhead should be cleaned including the wire tips and jewel bearing. All ink and ribbon fabric residue should be removed in this process. Do not attempt to clean inside the printhead case or around the cylinder the printhead coils.

4. Replace in reverse order.

4.5: CORRECTIVE MAINTENANCE

This section contains procedures for removing and replacing components of the printer. These procedures are supported by figures and parts lists which will aid the technician in identifying individual parts.

WARNING
The printer must be disconnected from the A.C. power supply before any corrective maintenance procedure is performed.

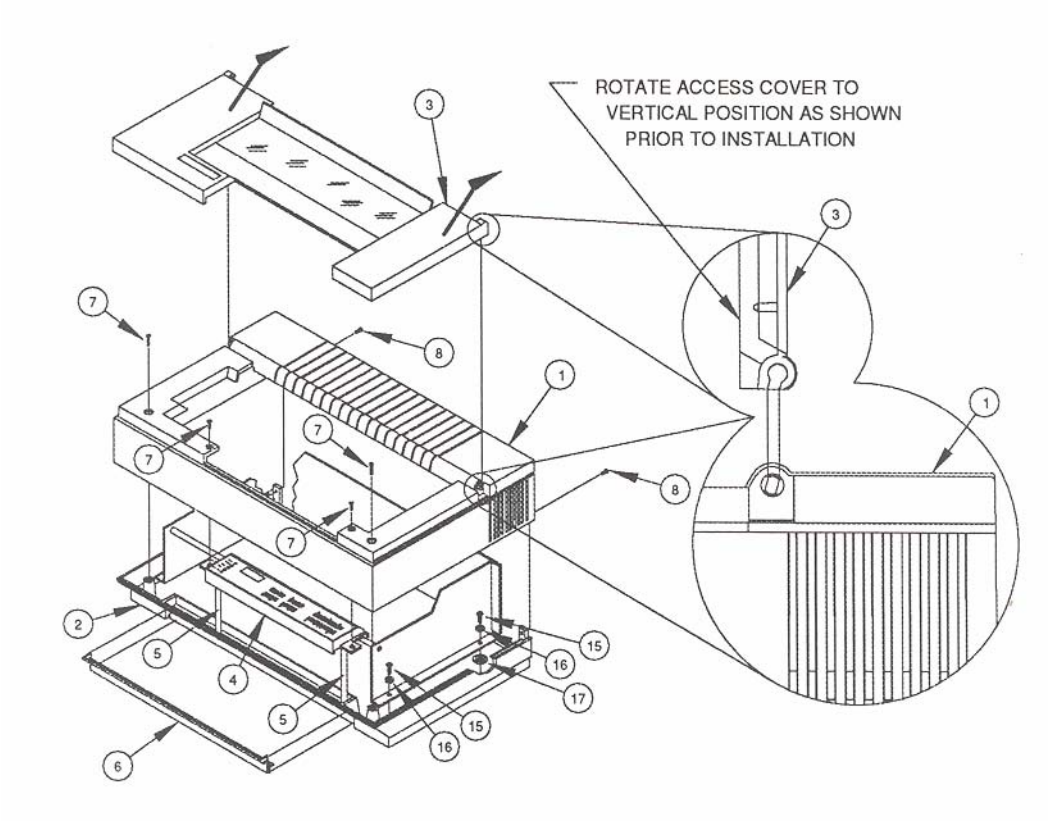


Figure 4.1: Coverset Removal

4.5.1: Top Cover Removal and Replacement - Figure 4.1

I. Raise the access cover (window assembly) (3) to a vertical position and remove it by pulling straight up.

2. Using a long shank Phillips screwdriver, remove the two front comer screws (7) in the bosses.

3. Remove the screw (7) at each end of the keypad support (4).

NOTE
Failure to remove these two screws before removing the top cover may result in damage to the keypad or the keypad cable.

4. Remove the two screws (8) on the back side of the top cover (1) and lift top cover.

WARNING
Do not operate the printer with the top cover removed.

5. Replace in reverse order.

4.5.2: Bottom Cover Removal and Replacements - Figure 4.1

1 . Remove top cover. (See Paragraph 4.5.1).

2. Remove the four screws (15, 16, 17) that secure the printer mechanism to the bottom cover.

3. Lift the keypad support (4) off the support tubes (5) and set it on top of the printer mechanism.

4. Lift the back of the mechanism up and slide the entire mechanism back until the front support (36) is clear of the bottom cover.

5. Replace in reverse order.

4.5.3: Operator Panel Removal and Replacement - Figure 4.1

1 . Remove top cover (See Paragraph 4.5.1).

2. Lift keypad support (4) off support tubes (5).

3. Disconnect keypad from cable by pushing out on header locking tabs.

4. Remove six screws holding PCB to keypad support.

5. Replace in reverse order.

4.5.4: Electronic Chassis Removal and Replacement - Figure 4.2.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove four screws (63) which secure the electronic chassis (62) to the printer frame.

3. Pull the chassis (62) out only far enough to access all cable connectors.

4. Remove all cable connectors from the controller board (21).

5. Remove electronic chassis (62) from frame.

6. Replace in reverse order.

4.5.5: Controller Board Removal and Replacement - Figure 4.2

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Remove ground screw (61).

CAUTION
Do not over-flex the controller board when removing from standoffs. Do not reach under the controller board with any object and attempt to pry it free from standoffs.

4. Pull the controller board (21) free from each standoff (67).

5. Pull the controller board (21) slightly away from the rear wall so the power connector (30) is accessible.

6. Remove connector (30).

7. Replace controller board in reverse order.

4.5.6: Fan Removal and Replacement - Figure 4.2.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4)

3. Disconnect connector (69) from power supply.

4. Remove two screws (58) and remove fan (57).

5. Replace in reverse order.

4.5.7: Power Supply PCB Removal and Replacement - Figure 4.2.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Remove all connectors from power supply PCB (45)

4. Remove two Phillips screws (46) securing power supply PCB (45) to electronic chassis (62).

5. Pull power supply PCB (45) free from standoffs.

6. Replace in reverse order.

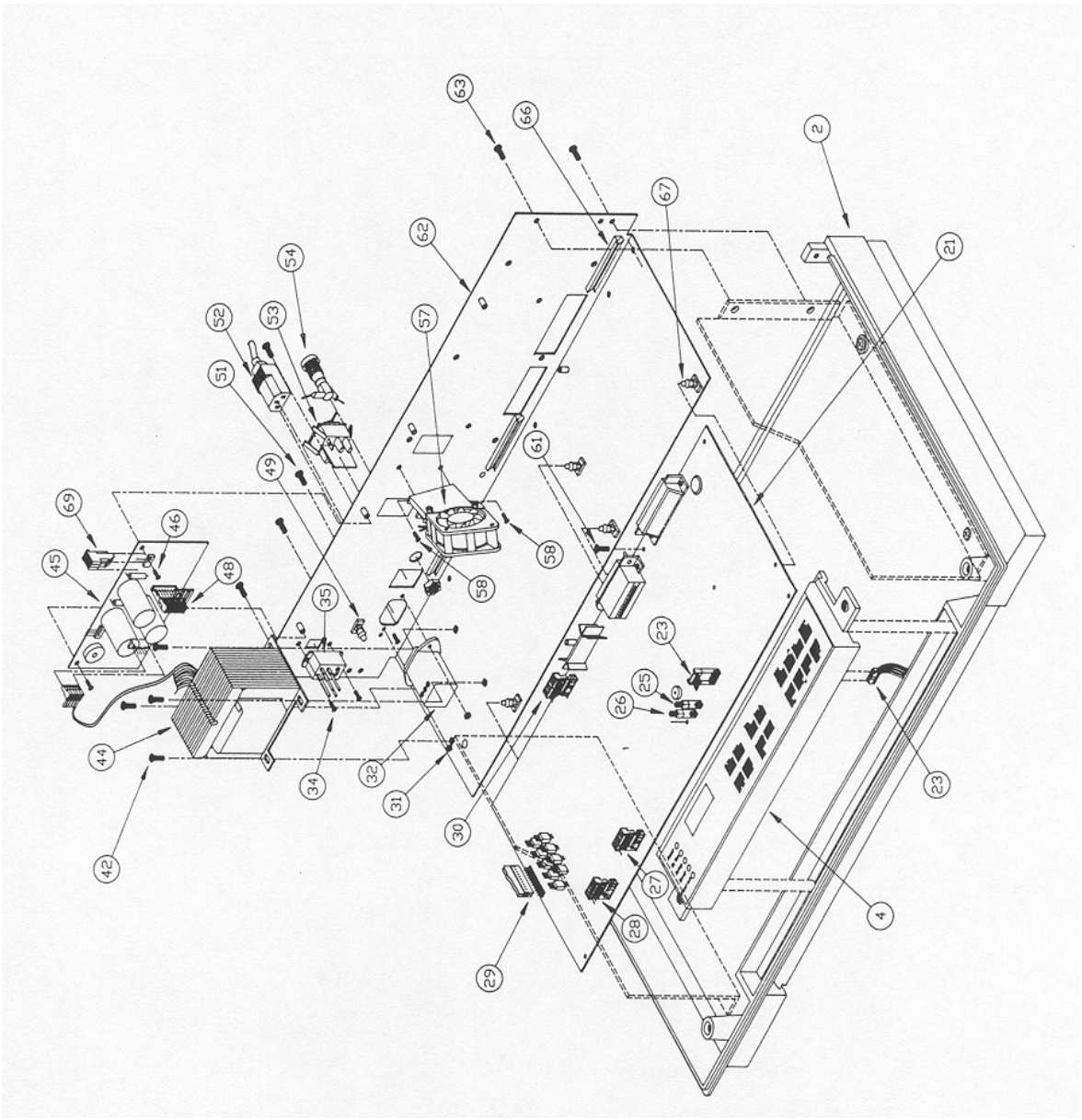


Figure 4.2: Electronic Module

4.5.8: Line Filter Removal and Replacement - Figure 4.2.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Tag line filter leads (32) to ensure correct reconnection then remove leads from transformer (44) and fuse holder (54).

4. Remove two screws (51) securing line filter (32) to electronic chassis and remove line filter.

5. Replace in reverse order.

4.5.9: Transformer Removal and Replacement - Figure 4.2.

1 . Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Disconnect transformer connector (44) from power supply.

4. Tag leads to ensure correct reconnection and remove leads.
5. Remove four screws (42) securing transformer (44) to electronic chassis and remove transformer.

6. Replace in reverse order.

4.5.10: Power Switch Removal and Replacement - Figure 4.2

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Remove controller board (see Paragraph 4.5.5).

4. Remove line filter (see Paragraph 4.5.8).

5. Remove transformer (see Paragraph 4.5.9).

6. Tag and remove leads from power switch (53).

7. The locking tabs which hold the power switch into the electronic chassis must be removed in order to remove the switch. Use a screwdriver to pry the tabs away from the switch, then use diagonal cutters to cut each tab.

8. A new switch ma then be installed into the electronic chassis by simply pressing it in.

9. Install leads onto replacement switch and replace transformer (44) and line filter (32).

4.5.11: Voltage Switch Removal and Replacement - Figure 4.2

1 . Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Tag leads of voltage switch (35) to ensure correct reconnection and remove leads.

4. Remove two screws (34) to securing voltage switch (35) to electronic chassis and remove voltage switch.

5. Replace in reverse order.

4.5.12: Fuse holder Removal and Replacement - Figure 4.2.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Tag leads of fuse holder (54) to ensure correct reconnection and remove lead.

4. Remove hex nut securing fuse holder (54) to electronic chassis and remove fuse holder.

5. Replace in reverse order.

4.5.13: Printhead Cable Removal and Replacement - Figure 4.2

1. Remove top cover (see Paragraph 4.5.1).

2. Move the electronic chassis (62) out from the print mechanism enough to access the printhead cable (29) and disconnect it from the controller board (21).

3. Disconnect printhead cable (29) from printhead (172).

4. Remove cable (29) from cable clamps,

5. The cable (29) passes through an opening under the left side of the plate. Pull the cable (29) toward the front of the printer until free of the printer.

6. Replace in reverse order.

4.5.14: Operator Panel Cable Removal and Replacement -Figure 4.2

1 . Remove top cover (see Paragraph 4.5.1).

2. Disconnect cable (23) from operator panel (4).

3. Remove bottom cover (see Paragraph 4.5.2).

4. Remove electronic chassis (see Paragraph 4.5.4).

5. Remove cable (23) from cable clamps on rear of lower power guide.

6. Replace in reverse order.

4.5.15: Ribbon Advance Drive Cable Removal and Replacement - Figure 4.3.

1 . Remove top cover (see Paragraph 4.5.1).

2. Move carriage (160) to the left endplate.

3. Stretch tensioning spring (75) and unhook cable eye from end of spring. Do not remove spring.

4. Thread cable (76) through left endplate.

CAUTION
Do not damage cable jacket when threading cable through endplate. Cables with damaged jackets must be replaced.

5. Replace in reverse order. Figure 4.3 illustrates how to wrap cables are ribbon advance mechanism.

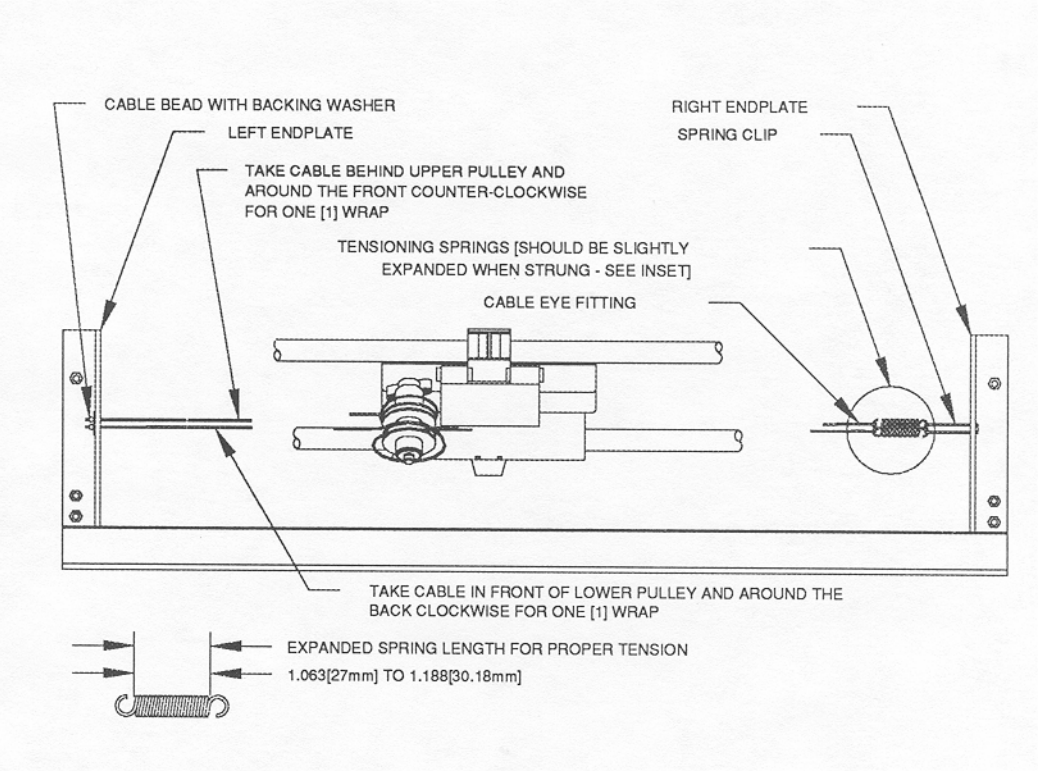

CABLE BEAD WITH BACKING WASHER
LEFT ENDPLATE
TAKE CABLE BEHIND UPPER PULLEY AND AROUND THE FRONT COUNTER-CLOCKWISE FOR ONE [1] WRAP
TENSIONING SPRINGS [SHOULD BE SLIGHTLY EXPANDED WHEN STRUNG - SEE INSET]
CABLE EYE FITTING
RIGHT ENDPLATE
SPRING CLIP
TAKE CABLE IN FRONT OF LOWER PULLEY AND AROUND THE BACK CLOCKWISE FOR ONE [1] WRAP
EXPANDED SPRING LENGTH FOR PROPER TENSION
1.063[27mm] TO 1.188[30.18mm]

Figure 4.3: Ribbon Advance Cable

4.5.16: Ribbon Advance Mechanism Removal and Replacement - Figure 4.4.

1 . Remove top cover (see Paragraph 4.5.1).

2. Remove operator panel (see Paragraph 4.5.3).

3 . Remove ribbon advance cables (see Paragraph 4.5.15).

4. Remove two screws (175) securing ribbon advance mechanism (161) to carriage (160) and remove mechanism.

5. Replace in reverse order.

6. After installation is complete, move the carriage left-right several times to make certain the drive blade is advancing counterclockwise.

4.5.17: Ribbon Cartridge Spring Clips Removal and Replacement - Figure 4.4.

1 . Lift access cover (3).

2. Remove ribbon cartridge.

3. Remove screw (163) securing spring clip (164) to carriage.

4. Replace in reverse order.

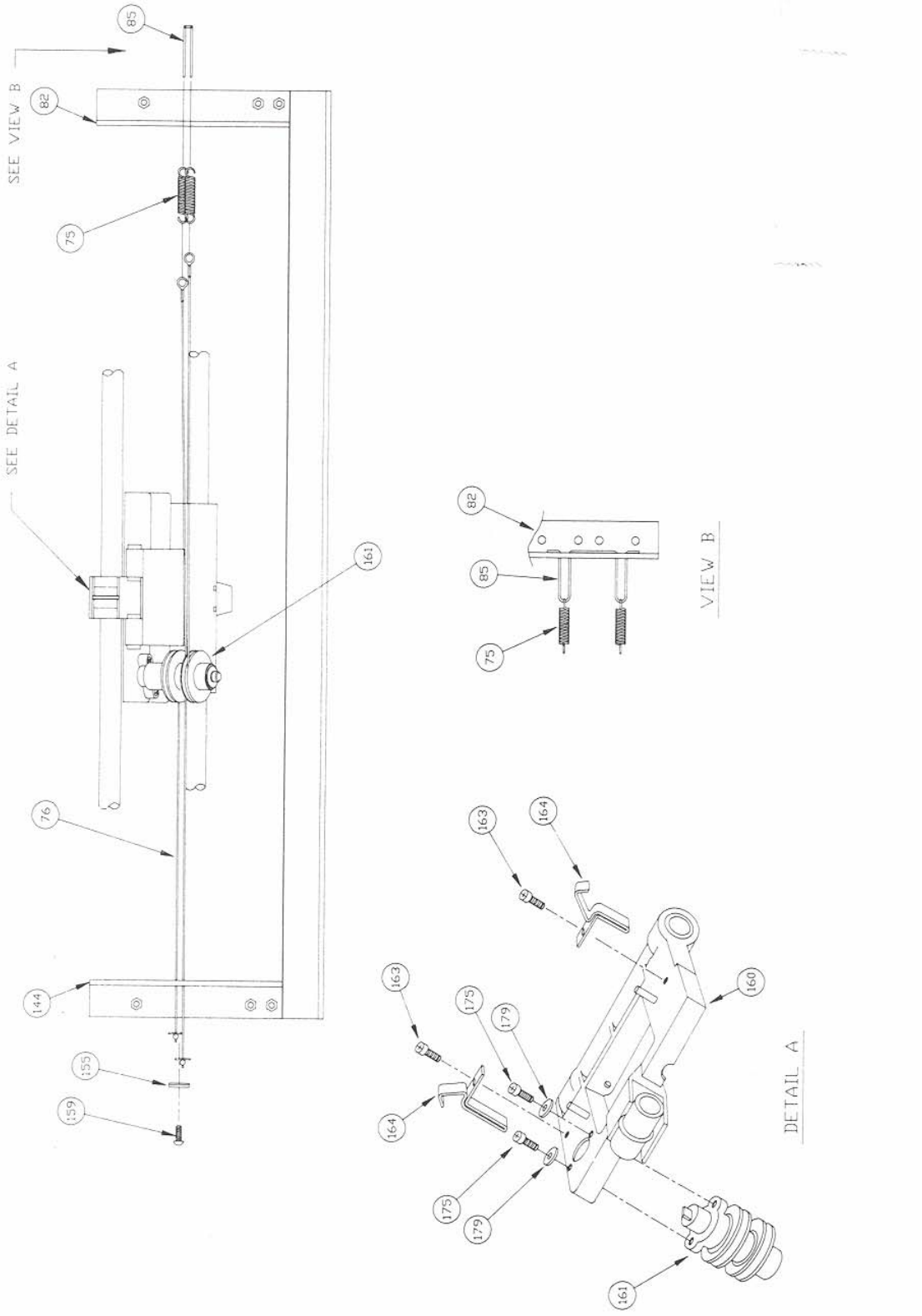


Figure 4.4: Ribbon Advance Mechanism

4.5.18: Carriage Drive Cables Removal and Replacement - Figure 4.7

1. Remove top cover.

2. As shown in Figure 4.5, depress the spring idler arm (156) and insert a screwdriver between the lower portion of the arm and the left endplate. This relieves the tension in the carriage drive system and makes it much easier to remove the drive cables.

3. With the carriage moved against the left endplate, loosen the outer nut (74) on the right hand cable stud. Hold the stud with pliers or a small wrench to prevent rotation of the stud and drive cable.

4. The inner nut (74) may now be removed. The right-hand cable (125) is now free of the carriage and may be threaded back through the right endplate (82) and back to the drive spool. The cable may be removed from the spool by slipping the cable and bead out of the small slot on the end of the drive spool.

5. The remaining left-hand cable (117) may be similarly removed by moving carriage to the right endplate and disconnecting the drive cable stud from the carriage bracket. The cable may now be unthreaded through the left endplate (144) and removed from the drive spool.

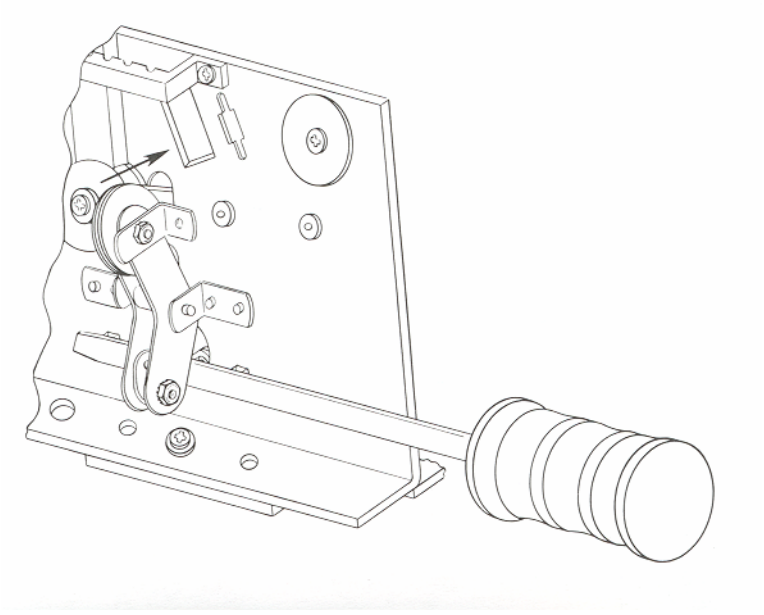


Figure 4.5: Push Pulley Towards Endplate

6. Prior to installation of new drive cables, carefully inspect the new pair of cables for damage to either the cable jacket or attached hardware. If any detectable defect is found in the replacement cable jackets, discard the damaged cable and procure an undamaged replacement.

CAUTION
When handling the drive cables around the printer mechanism, exercise extreme caution to avoid sharp edges of the printer frame.

7. Take the left-hand drive cable (117) (the longer of the two cables), and the outside nut (74) on the cable stud. Insert the stud through the carriage bracket and install the inner nut (74). Tighten these nuts securely such that the threaded portion of the cable stud is approximately centered in the carriage bracket.

8. Thread the beaded end of the left-hand cable (117) through the left end (144) around the spring-loaded idler pulley (156) and back through the endplate (144). The cable should run freely around the pulley with no contact with either the endplate or idler arm.

9. Pull the beaded end of the cable (117) over to the drive spool and start it as shown in Figure 4.6. The bead should bottom out in the slot and the cable should lead directly out into a groove coincident with the end of the cat bead slot.

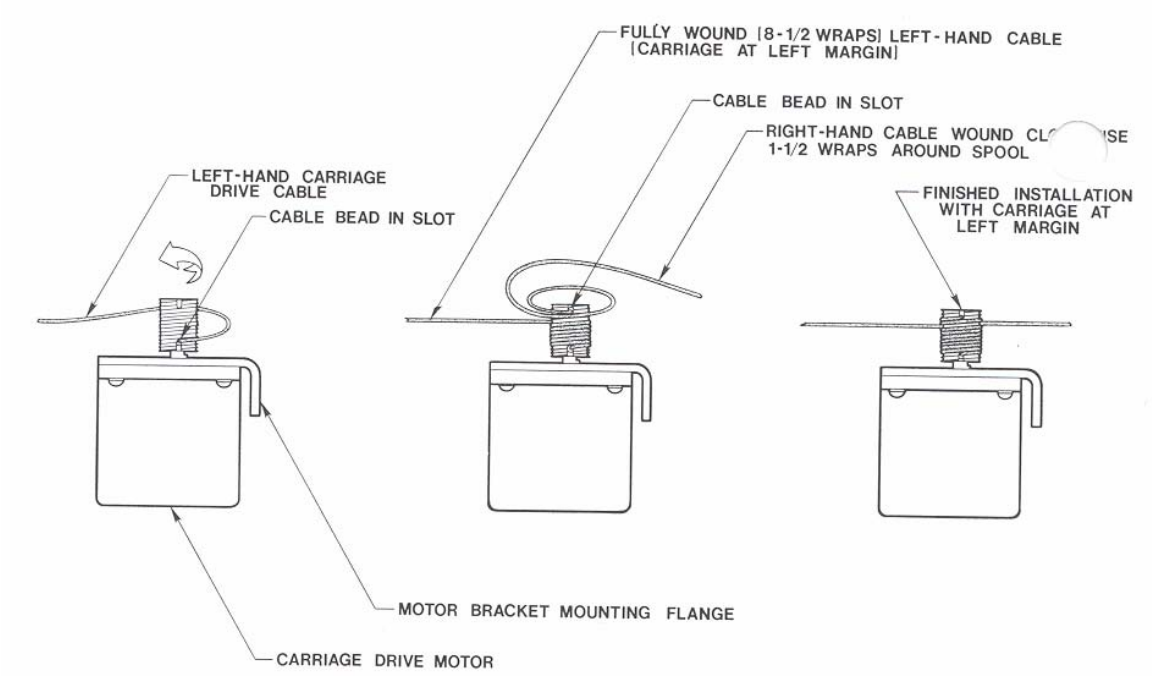

FULLY WOUND (8-1/2 WRAPS) LEFT-HAND CABLE (CARRIAGE AT LEFT MARGIN)
CABLE BEAD IN SLOT
RIGHT-HAND CABLE WOUND CL ISE 1-1/2 WRAPS AROUND SPOOL
LEFT-HAND CARRIAGE DRIVE CABLE
CABLE BEAD IN SLOT
FINISHED INSTALLATION WITH CARRIAGE AT LEFT MARGIN
MOTOR BRACKET MOUNTING FLANGE
CARRIAGE DRIVE MOTOR

Figure 4.6: Carriage Cables

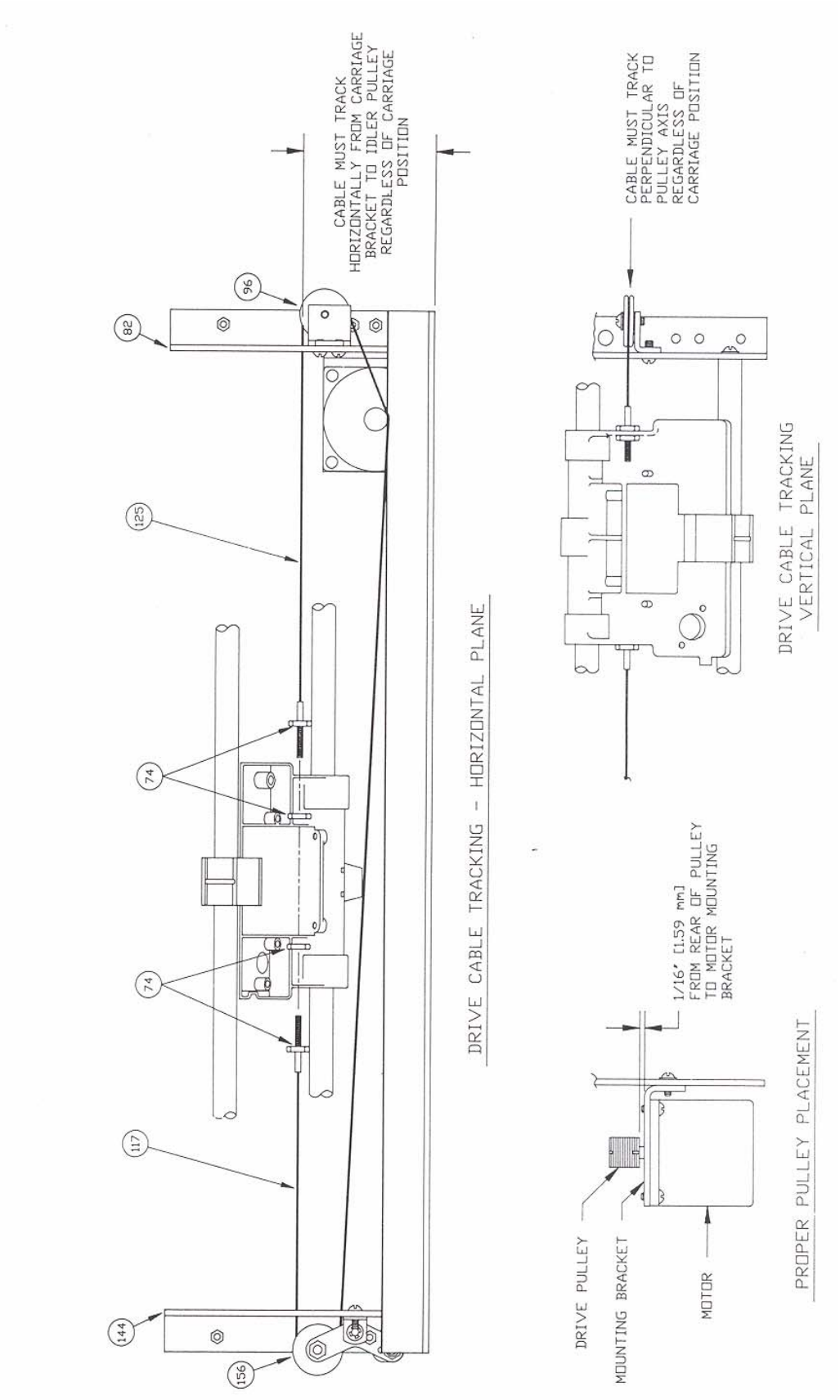


Figure 4.7: Carriage Cable Replacement

10. While holding a slight tension against the cable going onto the drive spool with one hand, use the other hand to rotate the motor shaft in a clockwise direction and wind the cable onto the spool until the carriage rests against the left endplate and all stack is taken up.

There should now be approximately 8 1/2 turns of cable on the spool on the end nearest the drive motor.

11. With the carriage against the left endplate, begin installation of the right-hand cable (125) by placing the beaded end of the cable into the outer slot on the drive spool. Lead the cable left into the groove at the end of the slot and place a finger over it to hold the cable in the proper groove.

12. Grasp the cable several inches from the spool and loop that cable around the spool in a clockwise direction as in Figure 4.6. Remove your finger from the first groove while holding tension on the cable and use your finger to hold the first complete wrap in place. Loop the cable around to the bottom of the spool for a total of 1 1/2 turns.

13. Using one hand to hold tension on the cable (125) from the spool, thread the stud end of the cable through the right endplate (82), around the idler pulley (96) and back through the endplate (82).

14. Continue to hold tension on the cable (125) and install the outside nut (74) on the right-hand cable stud. Install the cable stud as previously done in step 6.

15. Inspect the installation of the drive cable to the drive spool. It should appear as in Figure 4.6.

16. The screwdriver may now be removed from the idler arm (156) on the left endplate (144). The carriage drive system is now re-tensioned. Manually move the carriage across from one endplate to the other and observe the operation of the cable system.

    The system should move freely with only a slight drag caused by the carriage drive motor and the ribbon advance mechanism (if connected). Drive cables should track smoothly across the drive spool as the carriage is moved end to end.

17. Figure 4.7 illustrates how to inspect for proper vertical and horizontal tracking of the drive cables. Note that this inspection should be made with the deter handle in the center position. Simple replacement of cables should not require any adjustment of cable tracking. If other components such as idler pulleys or carriage cable brackets are changed, alignment of these components will be necessary. With the system strung, but with the tension relieved as in step 1 above, loosen and adjust affected pulleys and/or brackets until the cables track properly as in Figure 4.7. Be sure to securely re-tighten all hardware.

4.5.19: Spring-loaded Idler Pulley Removal and Replacement - Figure 4.8.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove left carriage drive cable (117) (see Paragraph 4.5.18).

3. Rotate, spool (pulley) (119) on carriage motor clockwise until carriage rests against the right endplate (82).

4. Remove brace from idler arm and allow spring to contract.

5. Remove two screws (131) securing the front right-angle bracket (139) to the left endplate (144) and remove bracket (139).

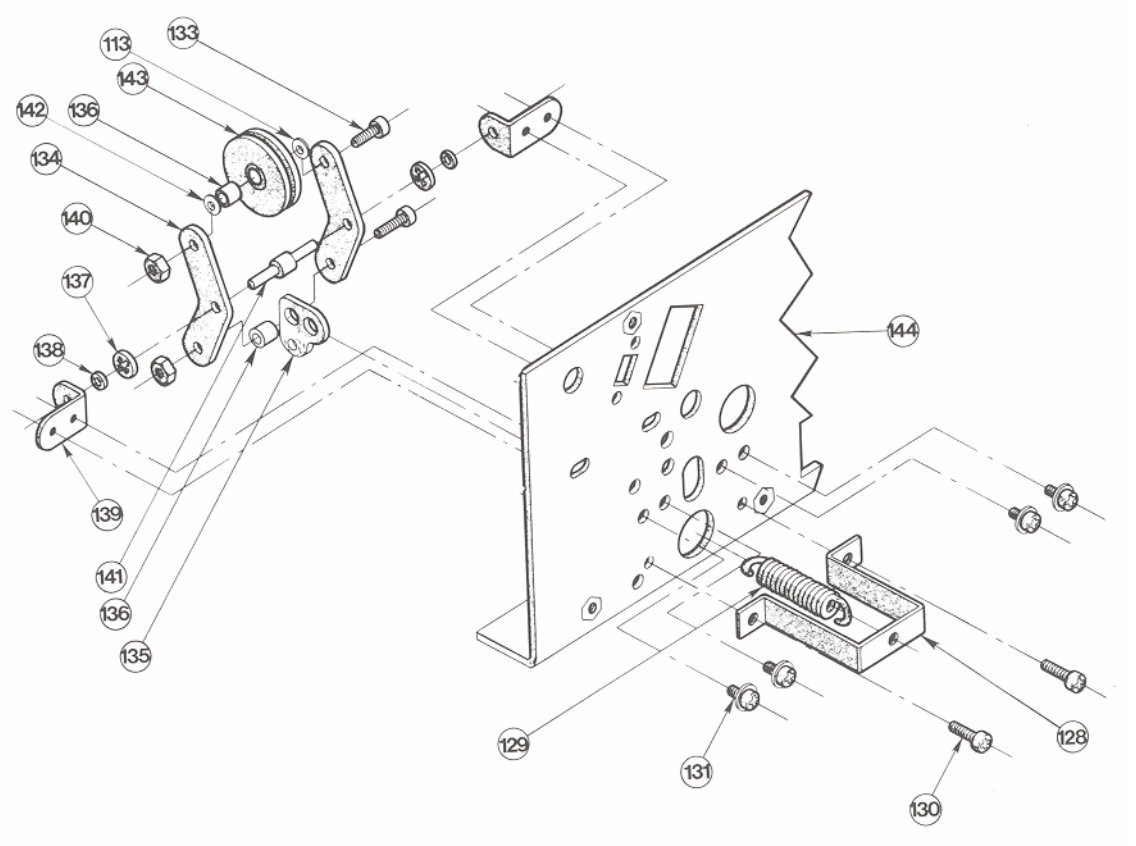


Figure 4.8: Spring Loaded Idler

6. Remove the idler shaft (141) from the remaining right angle bracket (139) and unhook the tensioning spring (129) from the spring bracket (128).

7. Remove spring bracket (128) (if it is to be replaced) by removing two screws (130) securing it to the left endplate (144).

8. Apply a light grease to the shaft prior to installation.

9. Replace in reverse order.

10. See Paragraph 4.5.18 for procedure to replace left carriage drive cable (117).

11. The carriage cable should track perpendicular to the pulley axis.

4.5.20: Fixed Idler Pulley Assembly Removal and Replacement - Figure 4.9

To remove the fixed idler pulley assembly from the right endplate:

1 . Remove the carriage drive cables (see Paragraph 4.5.18).

2. Remove the two screws (106) which attach the fixed idler bracket (96) to the right endplate (82). Set the defective assembly aside.

3. Replace in reverse order.

4. Restring the carriage drive cables and check the alignment of the fixed idler pulley.

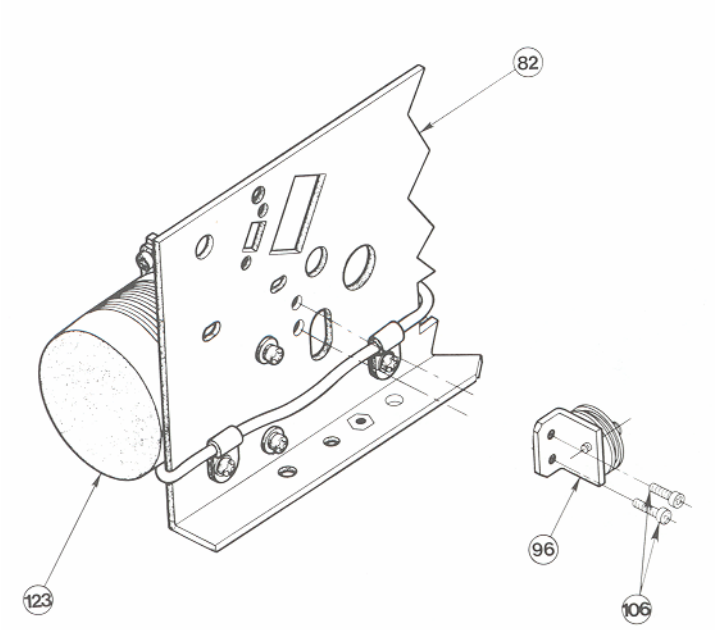


Figure 4.9: Fixed Idler

4.5.21: Left Margin Sensor Removal and Replacement - Figure 4.10

The left margin sensor is an electronic "photo-interrupter." It contains a light emitting diode (LED) on one side as a light source and a photo-transistor on the other side which acts as an on/off switch. The LED light source turns on the photo-transistor any time the carriage plate sensor flag is away from the sensor and the light travels through unobstructed. When the flag is in the sensor, the light is blocked and the photo-transistor turns off.

The microprocessor on the controller board reads the status of the photo-transistor to determine if the carriage is at the true left margin. This is a reference point and carriage position is calculated relative to this position.

Being a semi-conductor electronic device, the sensor is subject to failure. If this should happen, it is easily replaced as described below:

1. Move the carriage (160) away from the margin sensor (150) to allow ample working room.

2. Remove the electronic chassis (62) from the print mechanism (see Paragraph 4.5.4).

3. Locate the margin sensor cable connector in the cable harness which is behind the platen. Cut any wire ties necessary to free the sensor cable from the harness. Pull the sensor cable out of the endplate opening.

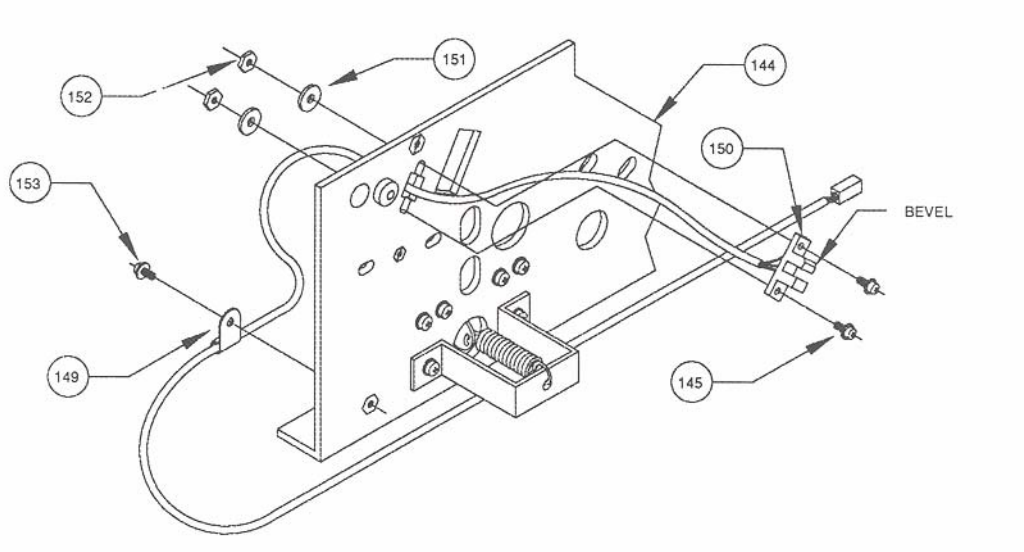


Figure 4.10: Left Margin Sensor

4. Remove the screws (153) that attach the two cable clamps (149) to the left endplate. Slip the clamps off the cable.

5. Remove the two screws (145) that attach the margin sensor (150) to the left endplate (144). Pull the cable and connector through the sensor opening in the endplate.

6. To install the new margin sensor, reverse steps 1 through 5 above. Do not over-tighten sensor mounting hardware as it is possible to crack the sensor housing.

It is important that the sensor cable be properly routed along the outside of the left endplate. This is to avoid interference with the spring idler assembly and with packaging and cover hardware.

4.5.22: Carriage Drive Motor Removal and Replacement - Figure 4.11

1. Remove top cover (see Paragraph 4.5.1).

2. Remove the carriage drive cables.

3. Remove screws (107) securing cable clamps (109) to right endplate.

4. Remove four screws (63) securing the electronic chassis and pull the electronic chassis out far enough to access the motor connector (27). Disconnect the motor connector (27) from the controller board (21).

5. Remove the two screws (105) which attach the carriage motor (123) to the endplates (82). The motor (123) may now be removed. Be sure to save the motor isolation pad (114) for reuse.

6. Remove the carriage drive spool (119) from the old motor shaft and install on the new motor shaft. Be sure that the set screw tightens down squarely on the flatted portion of the motor shaft. <u>This is extremely important</u>!

The rear edge of the drive spool should be spaced away from the <u>motor bracket</u> by a distance of 1/16 inch (1.59mm). The set screw must be tightened securely.

7. Replace in reverse order.

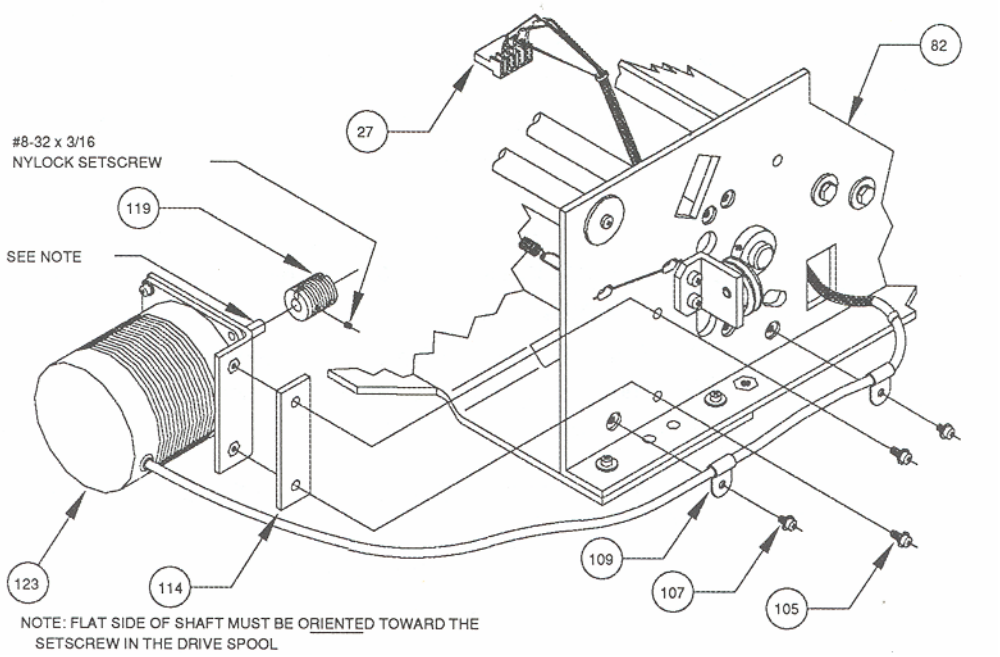


Figure 4.11: Carriage Drive Motor

4.5.23: Carriage Drive Spool Removal and Replacement - Figure 4.11

It is possible to replace a damaged or defective drive spool without removal of the carriage motor from the print mechanism. To replace the drive spool:

1. Remove carriage drive cables (see Paragraph 4.5.18).

2. Remove defective spool by loosening the set screw and slipping spool (1 from the motor shaft.

3. Install new drive spool. Refer to Paragraph 4.5.2 1, step 6.

4. Replace carriage drive cables (see Paragraph 4.5.18) to complete the installation.

4.5.24: Printhead Removal and Replacement - Figure 4.12

1. Remove top cover (see Paragraph 4.5.1)

2. Set the printhead adjustment lever (167) in the last detent position to provide the maximum printhead to platen gap.

3. Move the carriage (160) to the center of the carriage rails and disconnect the printhead cable connector (29) from the printhead (172).

4. Load paper into the printer to prevent damage to the platen surface or printwires in the event the printhead comes in contact with the platen.

5. Support the printhead (172) while loosening two screws (173) securing the printhead to the carriage (160).

6. Remove the printhead (172) from carriage (160). Avoid snagging the drive cables during removal.

7. Remove two screws (174) and remove bracket (171).

8. Replace in reverse order---critical adjustment for printhead to platen gap is required. Refer to Section 4.5.34.

4.5.25: Lower Carriage Rail Removal and Replacement - Figure 4.12.

The carriage rails are one of the most critical components in the print. They are manufactured to extremely tight specifications in dimensions, surface preparations and finish, and in material characteristics.

The rails are hardened, precision ground, and hard chrome plated to provide a suitable bearing surface for the sleeve bearings which ride on them. If the shaft surface becomes dented, scratched or matted, it will *drastically* reduce the life of the carriage bearings. Additionally, if the steel becomes exposed due to damage to the rail, corrosion could set in which will also accelerate bearing wear.

If a rail becomes bent, print registration will be affected and most likely the platen to printhead gap will be affected as well. The carriage rail should be immediately replaced to prevent possible damage to the printhead or components.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove printhead (see Paragraph 4.5.23).

3. Remove two screws (168) securing detent (169) to left endplate.

4. Remove Phillips screw (97) and loosen two set screws securing clamp (101) to right end of carriage rail (124) and remove eccentric clamp. If necessary, use a light mallet and a drift pin to tap the rail out of the clamp.

5. Insert a soft cloth through the left endplate hole and under the carriage rail (124). Slide the rail (124) out through the left endplate (144).

6. Remove the Phillips screw (166) and loosen the set screw securing the printhead adjustment lever (167) to the carriage rail (124).

7. Make sure the cloth is still inserted through the left endplate hole. Guide the new rail (124) through the hole, allowing it to slide on the cloth, through the carriage (160) to the right endplate (82). Remove the cloth and seat the shoulder of the rail (124) into the left endplate hole while guiding the right end of the rail through the hole in the right endplate (82).

8. Install eccentric clamp (101) on right end of carriage rail (124).

9. Install the detent (169) on left endplate (144).

10. Position the printhead adjustment lever (167) in the center detent position.

11. Position the alignment notch on the eccentric clamp (101) in the straight up position.

12. Secure eccentric clamp (101) with Phillips screw (97) and two set screws.

The printhead adjustment lever (167) should move easily with no binding. Check the printhead-to-platen gap with the printhead adjustment lever (167) in the first detent position. The gap should be 0.010” # 0.002. The technician should run a print sample and check for “uphill” or “downhill” print. This indicates the eccentric clamp is not positioned on the shaft correctly.

4.5.26: Upper Carriage Rail and Rear Bearing Removal and Replacement - Figure 4.12.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove printhead (see Paragraph 4.5.23).

3. Remove screws (104, 147) and washers (146, 110) from each end of the upper carriage rail (121).

4. Remove screw (103) which attaches the bottom flange of the right end (82) to the front bottom support plate (108).

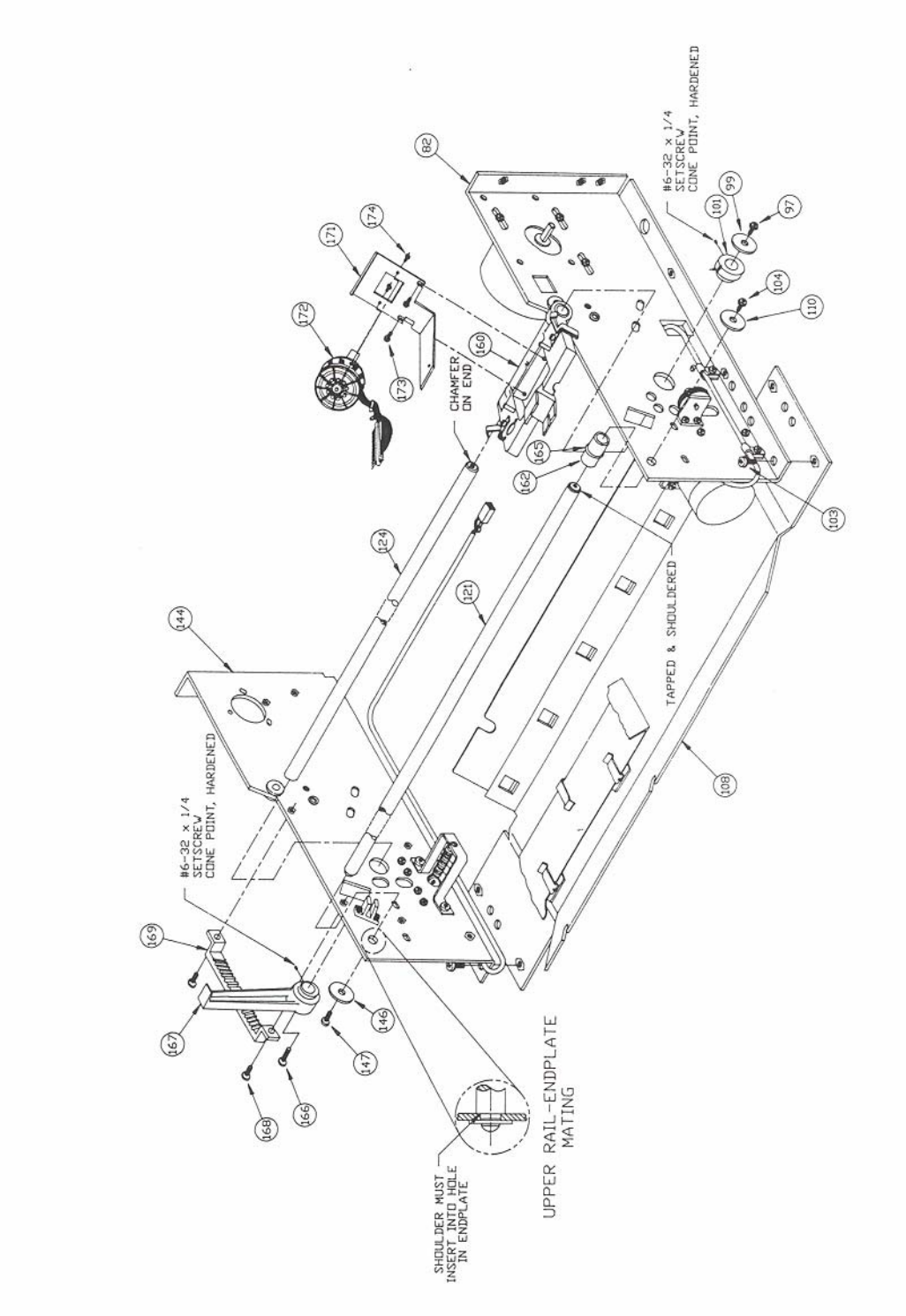


Figure 4.12: Carriage Removal

5. With the carriage (160) approximately in the center of the mechanism the right end of the upper carriage rail (121) with one hand and the right endplate (82) with the other hand. Pull the shoulder of the rail (121) from the hole in the endplate (82) and continue to pull it up and back in the normal carriage plane until it clears the endplate.

6. The left end of the carriage rail (121) may now be removed from the left endplate (144) and the rear bearing (162) slipped from the bearing carrier.

7. Take up the replacement shaft and inspect the shouldered and tapped ends. Be sure that the threads are clear of debris.

8. If a new rear bearing (162) is to be installed, slip a new "O"-ring (165) onto the bearing. Otherwise, continue with the original bearing and "O"-ring.

9. Install the replacement shaft (121) by reversing steps 1 through 4 above.

4.5.27: Carriage Removal and Replacement - Figure 4.12.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove ribbon advance cables (see Paragraph 4.5.15).

3. Remove ribbon advance mechanism (see Paragraph 4.5.23).

4. Remove carriage drive cables (see Paragraph 4.5.18).

5. Remove printhead (see Paragraph 4.5.23).

6. Remove lower carriage rail (Paragraph 4.5.24, steps 3 through 5).

7. Pull carriage (160) free of upper carriage rail (121).

8. Install replacement carriage (160) in reverse order.

4.5.28: Paper Drive Motor Removal and Replacement – Figure - 4.14

The paper advance drive motor is easily replaced as follows:

1. Remove top cover (see Paragraph 4.5.1).

2. Remove the electronics chassis from the printer mechanism (see Paragraph 4.5.4).

3. Locate the drive motor cable (28) and cut any wire ties needed to free the cable from the printer harness.

4. Loosen the three screws (195) which attach the motor (194) to the right endplate (82). Slide the motor (194) toward the platen and remove the drive belt (89).

5. Completely remove the three motor attachment screws (195) and the motor (194) may be removed and set aside.

6. Remove the motor pulley (78) from the old drive motor and install on the replacement drive motor. Make sure that the set screw is tightened onto the flat portion of the motor shaft.

7. Loosely install the drive motor (194) on the right endplate (82) and slip the drive belt (89) over the two pulleys. Make sure that the belt teeth properly engage the pulleys.

8. Adjust the drive belt tension as shown in Figure 4.13. Tighten motor hardware securely.

9. Check the belt for proper tracking. It may be necessary to loosen one or both pulleys and align them so that the belt tracks parallel to the endplate. Tighten the set screws in both pulleys securely.

4.5.29: Drive Belt Removal and Replacement - Figure 4.14

If the paper advance drive belt becomes cut or otherwise damaged or signs of fatigue such as cracking, fraying or missing teeth, it should be replaced. The procedure is as follows:

1. Remove top cover (see Paragraph 4.5.1).

2. Remove the electronics chassis from the print mechanism (see Paragraph 4.5.4).

3. Loosen the three drive motor attachment screws (195).

4. Slide the drive motor (194) forward toward the platen until the drive belt (8@ can be removed. Discard the defective belt.

5. Slip the replacement belt (89) onto the pulleys (90,78).

6. Adjust the drive belt tension as shown in Figure 4.13. Tighten motor hardware securely.

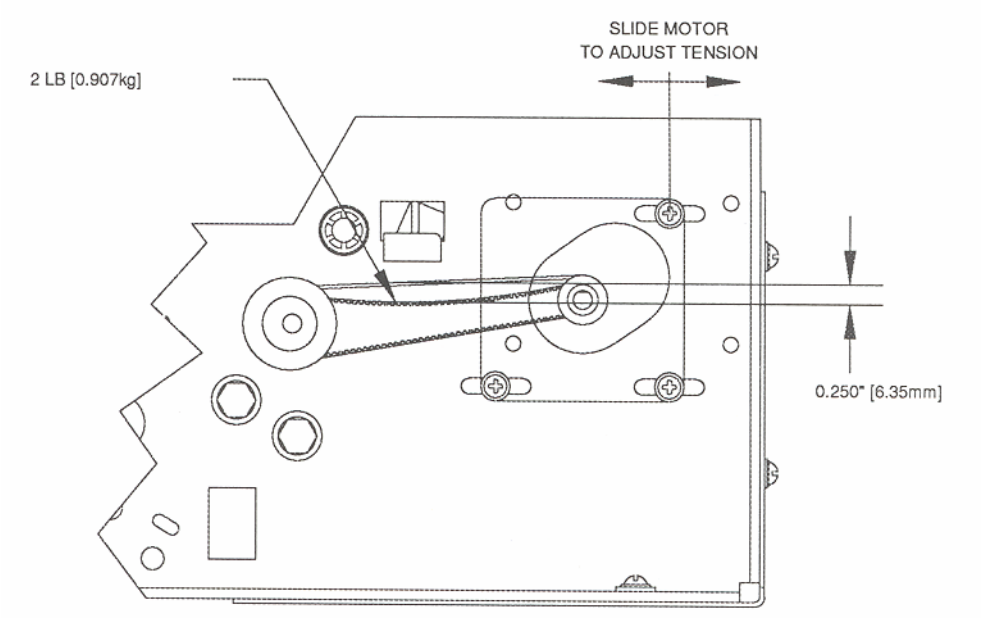


Figure 4.13: Drive Belt Tension

4.5.30: Paper Drive Shaft Removal and Replacement - Figure 4.14.

1. Remove top cover (see Paragraph 4.5.1).

2. Loosen set screws in drive shaft pulley (90) and motor pulley (78) an, simultaneously remove both pulleys and drive belt (89).

3. Remove the bearing retainer (83) from the right endplate (82). Grasp the drive shaft (188) with one hand and push it toward the right endplate (82) while restraining the endplate with the remaining hand. The shaft (188) should push the bearing (91) out of the endplate (82).

Carefully slide the drive shaft (188) to the right until it is free of both tractors and the right endplate (82).

4. Remove the bearing (91) from the old drive shaft (188).

Note that these bearings are sintered bronze and are relatively soft. Hard tools may distort the bearings and should not be used to handle them unless absolutely necessary.

5. Slip the bearing (91) over the replacement drive shaft (188) and insert the shaft through the right endplate (82).

6. Slide the shaft (188) through the right endplate (82) and through both tractors. Be sure that the alignment marks on each tractor are matched on the same side of the square drive shaft (188). See Figure 4.14.

7. Complete the installation by reversing steps 1 through 3 above.

8. Set proper tension in drive belt as shown in Figure 4.13.

4.5-31: Drive Shaft Bearings Removal and Replacement - Figure 4.14.

1. Remove top cover (see Paragraph 4.5.1).

2. Remove drive shaft (see Paragraph 4.5.30).

3. In step 3 of Paragraph 4.5.29, remove the left bearing (91) in addition to the right bearing (91). Discard the old bearings.

4. Insert the new bearing (91) into the left endplate (144) with the shoulder against the outside surface of the endplate. Secure with bearing retainer (83). Do not over-tighten screw (86) as this will deform the retainer (83) and possibly misalign the bearing (91).

5. Reassemble the drive shaft (188) to the printer mechanism as detailed in Paragraph 4.5.29.

4.5.32: Idler Shaft Removal and Replacement - Figure 4.14.

1. Remove top cover (see Paragraph 4.5.1).

2. Release the clutch handles on both the right and left tractors (191, 181). The clutch is released when the handle is in the “UP” position and is locked when the handle is in the “DOWN” position.

3. Use pliers to remove the two push-on retainers (80) on each end of the idle shaft (187). These retainers (80) should be discarded and not reused.

4. Move both tractors to the left end of the printer mechanism. Grasp the idler shaft (187) near the right end and slide the shaft to the left within the rubber grommets (79) until the right end of the shaft is free.

5. Raise the free end of the shaft (187) slightly above the right endplate (82) and slide the idler shaft to the right until it is free of the left endplate (144).

6. The idler shaft (187) may now be slipped from the tractors and set aside.

7. To install the replacement shaft, reverse steps 1 through 5 above. Be sure to install new push-on retainers (80) in step 2.

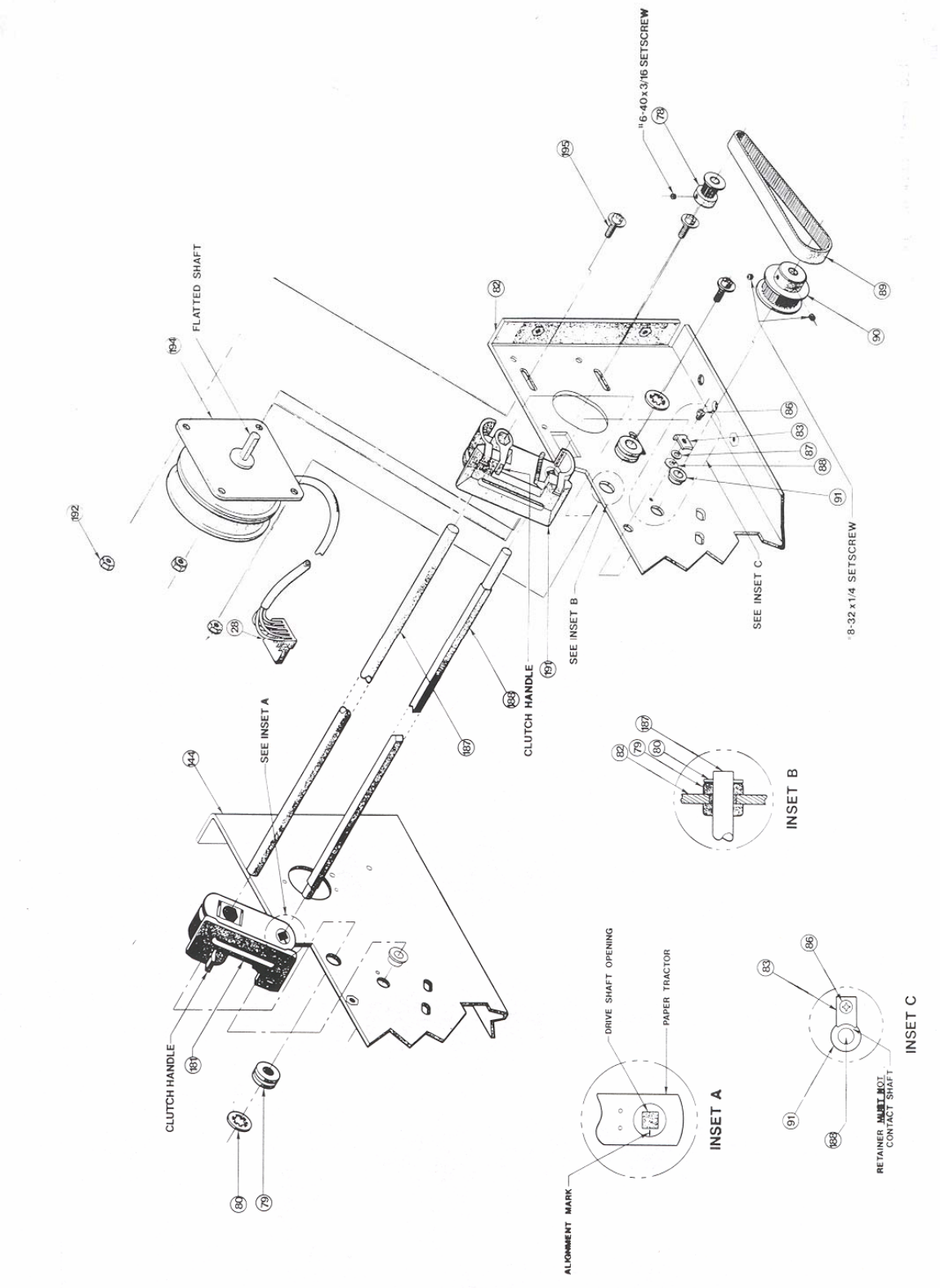


Figure 4.14: Paper Drive/Idler Shaft

4.5.33: Platen Removal and Replacement - Figure 4.16.

1. Remove top cover (see Paragraph 4.5.1)

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Remove printhead (see Paragraph 4.5.23).

4. Remove absorber panel retainers (180, 189).

5. Remove absorber panel (186).

6. Remove three screws (184) securing platen (I 85) to lower paper guide (190).

7. Remove four screws (15, 16, 17) securing left and right endplate (144, 82) to enclosure base.

8. Remove four hex screws (92) securing the platen (185) to the endplate (82).

CAUTION
After removing four platen screws, support the platen at all times to prevent the platen from dropping.

9. Hold rear of endplates (144, 82) and flex them outwardly enough to platen (185) to be moved.

10. Remove the platen (185) by moving it slightly down then out toward of the frame.

11. Replace in reverse order.

NOTE
Do not tighten platen screws (92) at this time. See platen alignment procedure, Paragraph 4.5.34.

12. When securing lower paper guide, make certain the lower paper guide aligned with the platen as shown in Figure 4.16.

4.5.34: Printhead to Platen Gap Alignment – Figure - 4.15.

Platen alignment must be done with great care to achieve maximum print quality and printhead performance. Care must be exercised to avoid damage to the platen surface and printwires while setting the printhead-to-platen gap.

1. Push the printhead adjustment lever toward the platen into the first detent position.

2. Tighten the platen bolts (92) to where the platen can still move but will stay where repositioned.

3. With the carriage positioned at the left margin, adjust the platen position until a gap of 0.012" +/- 0.001" exists between the tips of the printwires and the platen surface.

This measurement should be made from above the printhead with a flat feeler gage. Edges of the gage should be deburred to avoid scratching the platen.

4. Move the carriage to the extreme right margin and again adjust the platen position for a 0.012"+/-0.001" printhead-to-platen gap.

5. Repeat steps 3 and 4 until the same gap exists across the entire surface of the platen.

6. Carefully tighten the platen bolts (92) by alternating from one end to the other to minimize platen movement due to tightening.

7. Recheck gap measurements.

8. Once all four bolts (92) have been secured, use a torque wrench to apply a torque of 115 in-lb. (inch-pounds) to each bolt.

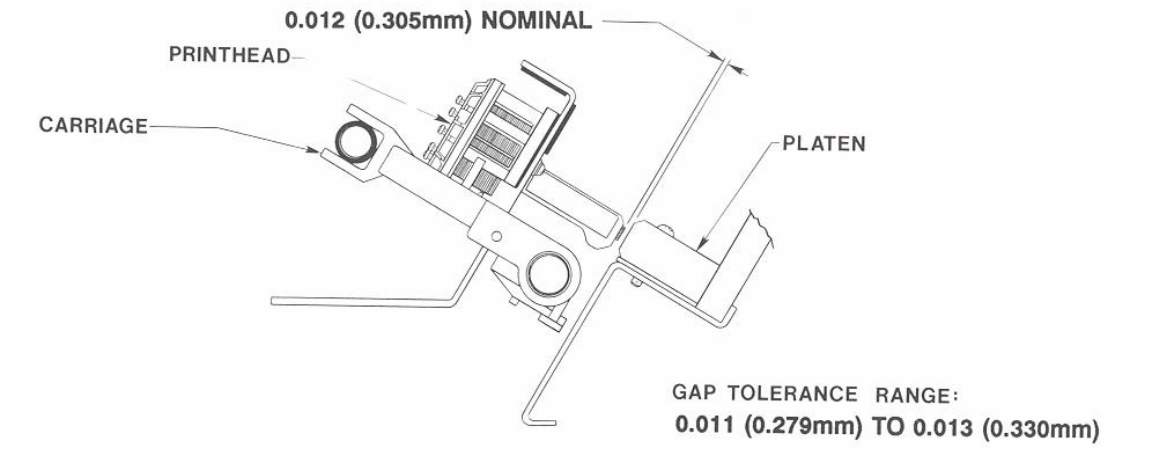


Figure 4.15: Printhead to Platen Gap Alignment

4.5.35: Lower Paper Guide/Paper Out Sensor Removal a Replacement - Figure 4.16

1. Remove top cover (see Paragraph 4.5.1).

2. Remove electronic chassis (see Paragraph 4.5.4).

3. Remove three screws (184) securing lower paper guide (190) to platen (185).

4. Remove four screws (15, 16, 17) securing printer mechanism to bottom cover (2) and lift rear of printer mechanism enough to remove lower paper guide (190).

5 . Replace in reverse order.

6 . Once installation is complete the lower paper guide must be aligned with the platen as shown in Figure 4.17.

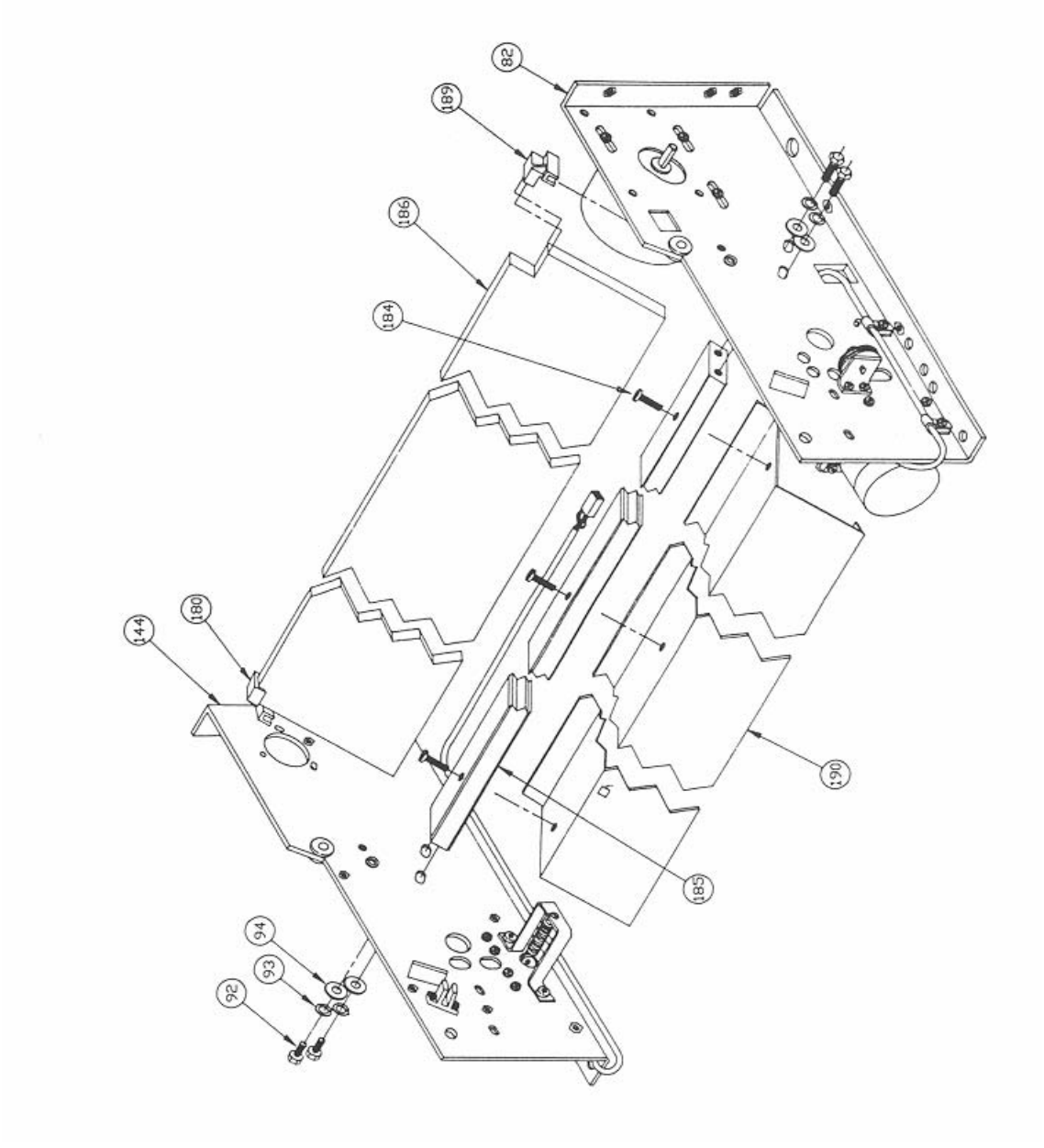


Figure 4.16: Lower Paper Guide

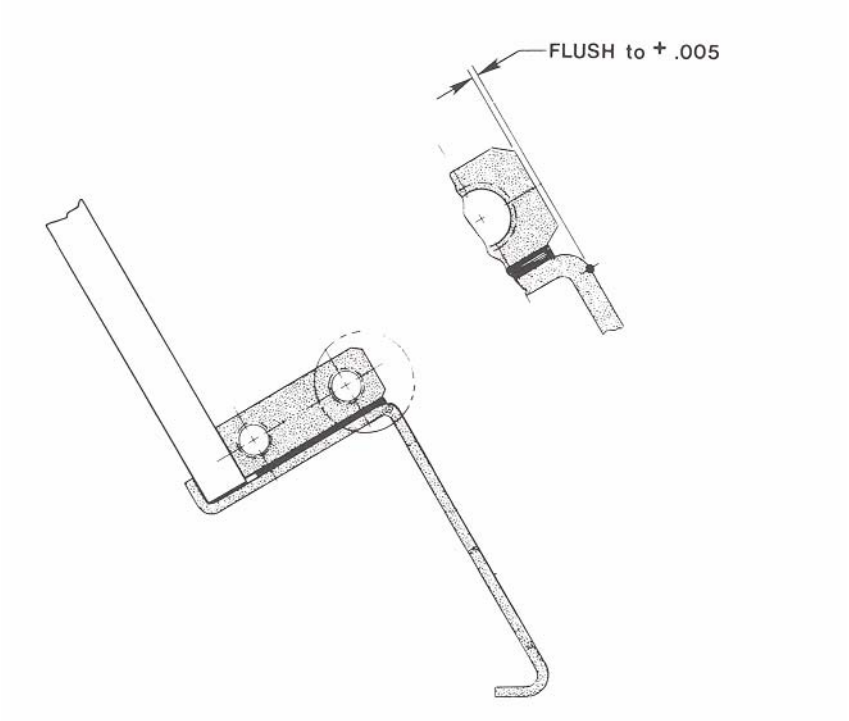


Figure 4.17:Lower Paper Guide/Platen Alignment

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	105895	COVER ASM, TOP	1
2	105894-1	BASE ASM, 300 XL	1
3	105896	WINDOW ASM	1
4	105828-1	SUPPORT ASM, KEYPAD	1
5	105817	TUBE, SUPPORT	2
6	105810	PANEL, FRONT	1
7	100234	SCREW, PHIL PAN HD - #8-32 X 5/8"	4
8	102166-4	SCREW, PHIL FLAT HD - #8-32 X 1/2"	2
9			
10			
11			
12			
13			
14			
15	101498	SCREW, SEMS FLT WASHER	4
16	100251	WASHER, FLAT 1/4	4
17	100346	WASHER, SHOULDER FRAME MTG	2
18			
19			
20			
21	105535-4	PCB ASM, VDE	1
22			
23	105877	CABLE ASM, FOLDED - 16 PIN (XL)	1
24			
25	100436-A	SENSOR, MARGIN - LEFT	1
26	100430-A	SENSOR, PAPER OUT	1
27	101520	CONNECTOR, MOTOR - CARRIAGE	1
28	CAB-101520	CONNECTOR, MOTOR - PAPER FEED	1

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
29	100450	CABLE, PRINTHEAD	1
30	101273	CABLE, POWER SUPPLY	1
31	100241	NUT, KEP - HEX HD #6-32	2
32	103903	FILTER ASM, LINE	1
33			
34	100415	SCREW, SEMS W/STAR & FLAT - #4-40 X 1/4"	2
35	105595	SWITCH ASM, VOLTAGE - VDE	1
36			
37			
38			
39			
40			
41			
42	100569	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/4"	4
43	101303	SHIELD, TRANSFORMER	6"
44	105596	TRANSFORMER, 115V / 230V -VDE	1
45	105621	PCB, POWER SUPPLY - UNIVERSAL VDE	1
46	100567	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
47			
48	101273	HARNESS, CONNECTOR	1
49	100961	SUPPORT, PCB	2
50			
51	100567	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
52	100962	CORD, POWER	1
53	105586	SWITCH ASM, PADDLE	1

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
54	103540	FUSEHOLDER	1
55			
56			
57	105490	FAN ASM, 2.36" SQUARE	1
58	100415	SCREW, SEMS W/STAR & FLAT - #4-40 X 1/4"	2
59			
60			
61	100254	SCREW,SEMS, W/STAR & FLAT - #6-32 X 3/8"	1
62	105587	CHASSIS, ELECTRICAL - 180 / 220 VDE	1
63	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	4
64			
65			
66	101025	GUIDE, PCB - SNAP IN	3
67	100961	SUPPORT, PCB	4
68			
69	101479-A	CONNECTOR, 1 X 3 - 24 GAGE	1
70			
71			
72			
73			
74	100240	NUT, KEP - HEX HD #5-40	4
75	100325	SPRING, CABLE - RIBBON ADVANCE	2
76	100285	CABLE, RIBBON ADVANCE	2
77			
78	100377	PULLEY, MOTOR - PAPER FEED	1

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
79	100348	GROMMET, SHAFT - TRACTOR IDLER	2
80	100266	RING, RETAINING	2
81			
82	105629	ENDPLATE, RIGHT	1
83	100269	RETAINER, BEARING	1
84			
85	102063	SPRING CLIP, RIBBON DRIVE	1
86	100225	SCREW, PHIL PAN HD - #4-40 X 1/4"	1
87	100246	WASHER, LOCK #4	1
88	100247	WASHER, LOCK #6	1
89	100352	BELT, TIMING - PAPER FEED	1
90	100376	PULLEY, SHAFT - TRACTOR	1
91	105613	BEARING, FLANGE - TRACTOR DRIVE SHAFT	2
92	100261	SCREW, HEX HD - 1/4-20 X 3/4"	4
93	100249	WASHER, LOCK 1/4	4
94	100251	WASHER, FLAT 1/4	4
95	100272	WASHER, NYLON	2
96	100433	IDLER, FIXED	1
97	100568	SCREW, SEMS W/INT STAR - #8-32 X 1/2"	1
98	-100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	1
99	101125	WASHER, FLAT #8 (ID) X 3/4" (OD)	1
100	-100273	CLAMP, CABLE - ROUND	1
101	100334	CLAMP, ECCENTRIC	1
102	-100347	BUMPER, STOP - END	2
103	-100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	2

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
104	100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	1
105	100255	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
106	100231	SCREW, PHIL PAN HD - #8-32 X 1/4"	2
107	100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	2
108	102582	SUPPORT, BOTTOM - FRONT	1
109	100273	CLAMP, CABLE - ROUND	1
110	100250	WASHER, FLAT - 3/16" (ID) X 1" (OD)	1
111			
112			
113	101126	WASHER, WAVE - IDLER	1
114	100351	ISOPAD, MOTOR - CARRIAGE	1
115			
116	102709	TENSIONER, MYLAR	1
117	100287	CABLE, DRIVE - CARRIAGE (LEFT)	1
118	100263	SCREW, SET - #8-32	1
119	100295	PULLEY, DRIVE - CARRIAGE	1
120	100301	BRACKET, MOTOR - CARRIAGE	1
121	100296	SHAFT, CARRIAGE - UPPER	1
122	100255	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	3
123	100431	MOTOR, CARRIAGE - 180	1
124	100299	SHAFT, CARRIAGE - LOWER	1
125	100286	CABLE, DRIVE - CARRIAGE (RIGHT)	1
126	100274	CLAMP, CABLE - FLAT	4
127			
128	100314	BRACKET, MOUNTING - SPRING	1
129	100324	SPRING, IDLER	1

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
130	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	2
131	100254	SCREW,SEMS, W/STAR & FLAT - #6-32 X 3/8"	4
132	105888	FOAM, SUPPORT - FRONT	1
133	100234	SCREW, PHIL PAN HD - #8-32 X 5/8"	2
134	100315	BRACKET, PULLEY - LOADED IDLER	2
135	100318	BRACKET, SPRING - PIVOT	1
136	100265	SPACER	2
137	100268	RING, RETAINING	2
138	100271	WASHER, NYLON - IDLER	2
139	100317	BRACKET, MOUNTING - RIGHT ANGLE	2
140	100242	NUT, KEP - #8-32	2
141	100297	SHAFT, IDLER - SPRING LOADED	1
142	101127	WASHER, FLAT - IDLER	1
143	102732	PULLEY, IDLER - CARRIAGE	1
144	105630	ENDPLATE, LEFT	1
145	100227	SCREW, PHIL PAN HD - #4-40 X 1/2"	2
146	100250	WASHER, FLAT - 3/16" (ID) X 1" (OD)	1
147	100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	1
148			
149	100273	CLAMP, CABLE - ROUND	1
150	100436-A	SENSOR ASM, MARGIN	1
151	100243	WASHER, FLAT - #8	2
152	100239	NUT, KEP - HEX HD #4-40	2
153	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	1
154			

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
155	100322	BRACKET, CABLE - RIBBON	1
156	100442-2	IDLER, LOADED - SPRING	1
157			
158			
159	100254	SCREW,SEMS, W/STAR & FLAT - #6-32 X 3/8"	1
160	105825	CARRIAGE ASM, MOLDED	1
161	100448	DRIVE MECHANISM, RIBBON - ADVANCE	1
162	105819	BEARING, CARRIAGE - REAR	1
163	100566	SCREW, SEMS W/INT STAR - #6-32 X 1/4"	2
164	105594	CLIP, SPRING - RIBBON	2
165	105820	O-RING, BEARING - CARRIAGE	1
166	100571	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/2"	1
167	100336	LEVER, ECCENTRIC	1
168	100231	SCREW, PHIL PAN HD - #8-32 X 1/4"	2
169	100335	DETENT, LEVER	1
170			
171	100303	BRACKET, PRINTHEAD	1
172	105813	PRINTHEAD, XL 300	1
173	100254	SCREW,SEMS W/STAR & FLAT - #6-32 X 3/8"	2
174	100253	SCREW, SEMS W/STAR & FLAT - #4-40 X 3/8"	2
175	100747	SCREW, PHIL PAN HD - #4-40 X 3/8"	2
176			
177			
178			
179	100246	WASHER, LOCK - #4	2

Table 4.2 XL 300 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
180	101404	RETAINER, DAMPER - LEFT	1
181	100341	TRACTOR, FORMS - LEFT	1
182	100430-A	SENSOR ASM, PAPER OUT	1
183	101253	DAMPER, PLATEN	1
184	100234	SCREW, PHIL PAN HD - #8-32 X 5/8"	3
185	105942	PLATEN, XL	1
186	102555-1	PANEL, ABSORBER - REAR (XL)	1
187	100294	SHAFT, IDLER - TRACTOR	1
188	100293	SHAFT, DRIVE - PAPER ADVANCE	1
189	101501	RETAINER, DAMPER - RIGHT	1
190	105444	GUIDE, PAPER - LOWER	1
191	100340	TRACTOR, FORMS - RIGHT	1
192	100242	NUT, KEP - #8-32	3
193	105588	MODULE, ELECTRONICS - VDE	1
194	100432	MOTOR, PAPER FEED - 180	1
195	100571	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/2"	3

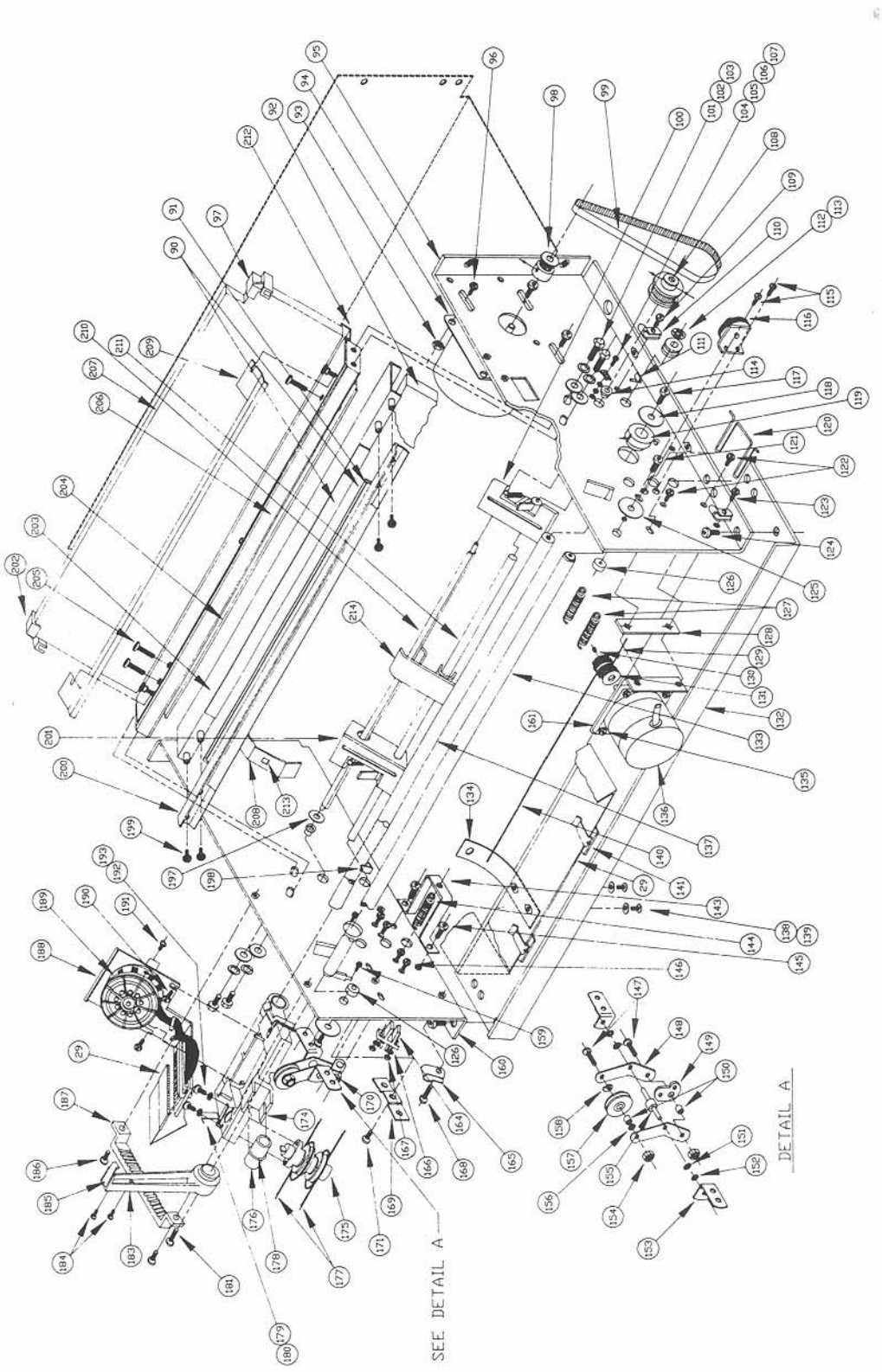


Figure 4.18: Illustrated Parts Breakdown

Table 4.3 XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	105895	COVER ASM, TOP	1
2	105894-3	BASE ASM, 300 XLDD	1
3	105897	THROAT ASM	1
4	105828-1	SUPPORT ASM, KEYPAD	1
5	105817	TUBE, SUPPORT	2
6	105810	PANEL, FRONT	1
7	100234	SCREW, PHIL PAN HD - #8-32 X 5/8"	4
8	102166-4	SCREW, PHIL FLAT HD - #8-32 X 1/2"	2
9			
10			
11			
12			
13			
14			
15	101498	SCREW, SEMS FLAT WASHER	4
16	100251	WASHER, FLAT 1/4	4
17	100346	WASHER, SHOULDER FRAME MTG	2
18			
19			
20			
21	105535-4	PCB ASM, VDE	1
22			
23	105877	CABLE ASM, FOLDED - 16 PIN (XL)	1
24			
25	100436-A	SENSOR, MARGIN - LEFT	1
26	100430-A	SENSOR, PAPER OUT	1
27	101520	CONNECTOR, MOTOR - CARRIAGE	1
28	101520	CONNECTOR, MOTOR - PAPER FEED	1

Table 4.3 XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
29	100450	CABLE, PRINTHEAD	1
30	101273	CABLE, POWER SUPPLY	1
31	100241	NUT, KEP - HEX HD #6-32	2
32	103903	FILTER ASM, LINE	1
33			
34	100415	SCREW, SEMS W/STAR & FLAT - #4-40 X 1/4"	2
35	105595	SWITCH ASM, VOLTAGE - VDE	1
36			
37			
38			
39			
40			
41			
42	100569	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/4"	4
43	101303	SHIELD, TRANSFORMER	6"
44	105596	TRANSFORMER, 115V / 230V-VDE	1
45	105621	PCB, POWER SUPPLY - UNIVERSAL VDE	1
46	100567	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
47			
48	101273	HARNESS, CONNECTOR	1
49	100961	SUPPORT, PCB	2
50			
51	100567	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
52	100962	CORD, POWER	1
53	105586	SWITCH ASM, PADDLE	1

Table 4-3 XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
54	103540	FUSEHOLDER	1
55			
56			
57	105490	FAN ASM, 2.36" SQUARE	1
58	100415	SCREW, SEMS W/STAR & FLAT - #4-40 X 1/4"	2
59			
60			
61	100254	SCREW,SEMS, W/STAR & FLAT - #6-32 X 3/8"	1
62	105587	CHASSIS, ELECTRICAL - 180 / 220 -VDE	1
63	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	4
64			
65			
66	101025	GUIDE, PCB - SNAP IN	3
67	100961	SUPPORT, PCB	4
68			
69	101479-A	CONNECTOR, 1 X 3 - 24 GAGE	1
70			
71			
72			
73			
74			
75			
76			
77			
78			
79			

Table 4.3 - XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
80			
81			
82			
83			
84			
85			
86			
87			
88			
89			
90	102134	TAPE, TEFLON CONDUCTIVE	32"
91	101694	TENSIONER, PAPER (DD)	1
92	102237-1	PANEL, ABSORBER - XL	1
93	100242	NUT, KEP - HEX HD #8-32	3
94	100432	MOTOR, PAPER FEED	1
95	102432	ENDPLATE, RIGHT -(DD)	1
96	100571	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/2"	3
97	101501	RETAINER, DAMPER - RIGHT	1
98	100377	PULLEY, MOTOR - PAPER	1
99	101695	BELT, TIMING	1
100	102474	TRACTOR, FORMS - RIGHT (DD)	1
101	100261	SCREW, HEX HD - 1/4-20 X 3/4"	4
102	100249	WASHER, LOCK - 1/4	4
103	100251	WASHER, FLAT - 1/4" (ID) X 5/8" (OD)	4
104	100225	SCREW, PHIL PAN HD - #4-40 X 1/4"	1
105	100269	RETAINER, BEARING	1
106	100246	WASHER, LOCK - #4	1
107	100247	WASHER, LOCK - #6	1

Table 4.3 XL-300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
108	100376	PULLEY, TRACTOR	1
109	100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	1
110	100273	CLAMP, CABLE - ROUND	1
111	102239	BRACKET, SA PANEL - RIGHT (DD)	1
112	100266	RING, RETAINING	2
113	100348	GROMMET, SHAFT - TRACTOR IDLER	2
114	100327	BEARING, FLANGE	2
115	100231	SCREW, PHIL PAN HD - #8-32 X 1/4"	2
116	100433	IDLER, FIXED	1
117	100568	SCREW, SEMS W/INT STAR - #8-32 X 1/2"	1
118	101125	WASHER, FLAT - #8 (ID) X 3/4" (OD)	1
119	100334	CLAMP, ECCENTRIC	1
120	102063	SPRING CLIP, RIBBON DRIVE	1
121	100570	SCREW, SEMS W/FLAT WASHER - #8-32 X 3/8"	2
122	100255	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	2
123		SEE ITEMS 109 AND 110	
124	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	2
125	100250	WASHER, FLAT - 3/16" (ID) X 1" (OD)	2
126	100347	BUMPER, STOP - END	2
127	100325	SPRING, CABLE	2
128	100351	ISOPAD, MOTOR - CARRIAGE	1
129	100286	CABLE, DRIVE	1
130	100263	SCREW, SET - NYLOK	1
131	100295	PULLEY, DRIVE - CARRIAGE	1
132	101686	SUPPORT, BOTTOM - FRONT (DD)	1

Table 4.3 XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
133	100296	SHAFT, CARRIAGE	1
134	101941	TENSIONER, SENSOR (DD)	2
135	100255	SCREW, SEMS W/INT STAR - #6-32 X 1/2"	3
136	100431	MOTOR, CARRIAGE	1
137	100299	SHAFT, CARRIAGE	1
138	100231	SCREW, PHIL PAN HD - #8-32 X 1/4"	2
139	100250	WASHER, FLAT - 3/16" (ID) X 1" (OD)	2
140	100287	CABLE, DRIVE	1
141	100274	CLAMP, CABLE - FLAT	3
142			
143	100314	BRACKET, MOUNTING - SPRING	1
144	100324	SPRING, IDLER	1
145	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	2
146	100254	SCREW, SEMS W/STAR & FLAT - #6-32 X 3/8"	4
147	100234	SCREW, PHIL PAN HD - #8-32 X 5/8"	2
148	100315	BRACKET, PULLEY - LOADED IDLER	2
149	100318	BRACKET, SPRING - PIVOT	1
150	100265	SPACER	2
151	100268	RING, RETAINING	2
152	100271	WASHER, NYLON - IDLER	2
153	100317	BRACKET, MOUNTING - RIGHT ANGLE	2
154	100242	NUT, KEP - #8-32	2
155	100297	SHAFT, IDLER - SPRING LOADED	1
156	101127	WASHER, FLAT - IDLER	1
157	102732	PULLEY, IDLER	1
158	101126	WASHER, WAVE - IDLER	1

Table 4.3 XL 300 DD PARTS LIST			
ITEM NO.	PART NO.	DESCRIPTION	QTY
159	100227	SCREW, PHIL PAN HD - #4-40 X 1/2"	2
160	102431	ENDPLATE, LEFT (DD)	1
161	100301	BRACKET, MOTOR - CARRIAGE	1
162			
163			
164	100436-A	SENSOR, MARGIN	1
165	100273	CLAMP, CABLE - ROUND	1
166	100243	WASHER, FLAT - #4	2
167	100239	NUT, KEP - HEX HD #4-40	2
168	100256	SCREW, SEMS W/STAR & FLAT - #8-32 X 3/8"	1
169	100322	BRACKET, CABLE - RIBBON	1
170	100442-2	IDLER, SPRING LOADED	1
171	100254	SCREW, SEMS W/STAR & FLAT - #6-32 X 3/8"	1
172			
173			
174	105825	CARRIAGE ASM, MOLDED	1
175	100448	MECHANISM, DRIVE - RIBBON ADVANCE	1
176	105819	BEARING, CARRIAGE - REAR (XL)	1
177	100285	CABLE, ADVANCE - RIBBON	2
178	105820	O-RING	1
179	105594	CLIP, SPRING - RIBBON (VDE)	2
180	100566	SCREW, SEMS W/INT STAR - #6-32 X 1/4"	2
181	100571	SCREW, SEMS W/FLAT WASHER - #8-32 X 1/2"	1
182			
183	100336-1	LEVER, ECCENTRIC (DD)	1

Table 4.3 XL 300 DD PARTS LIST			
ITEM NO.	PART NO.	DESCRIPTION	QTY
184	100228	SCREW, PHIL PAN HD - #6-32 X 1/4"	2
185	101693	HANDLE, LEVER - DETENT (DD)	1
186	100231	SCREW, PHIL PAN HD - #8-32 X 1/4"	2
187	100335	DETENT, LEVER	1
188	101662	BRACKET, PRINTHEAD (DD)	1
189	105813	PRINTHEAD, XL 300	1
190	100254	SCREW, SEMS W/STAR & FLAT - #6-32 X 3/8"	2
191	100253	SCREW, SEMS W/STAR & FLAT - #4-40 X 3/8"	2
192	100747	SCREW, PHIL PAN HD - #4-40 X 3/8"	2
193	100246	WASHER, LOCK - #4	2
194			
195			
196			
197	100272	WASHER, NYLON	2
198	102240	BRACKET, SA PANEL - LEFT (DD)	1
199	100568	SCREW, SEMS W/INT STAR - #8-32 X 1/2"	4
200	101688	RETAINER, TENSIONER (DD)	1
201	102475	TRACTOR, FORMS - LEFT (DD)	1
202	101404	RETAINER, DAMPER - LEFT	1
203	102234	SUPPORT, PAPER - LOWER (DD)	1
204	101253	DAMPER, PLATEN	1
205	100236	SCREW, PHIL PAN HD - #8-32 X 1"	3
206	105942	PLATEN, DD	1
207	102236-1	PANEL, ABSORBER - UPPER (DD)	1
208	102233	PLATE, MOUNTING - SENSOR (DD)	1
209	101947	TEAR BAR, DD	1

Table 4.3 XL 300 DD PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
210	100293	SHAFT, DRIVE - PAPER ADVANCE	1
211	100294	SHAFT, IDLER - TRACTOR	1
212	102241	SHIELD, MOUNTING - SA PANEL (DD)	1
213	100430-A	SENSOR ASM, PAPER OUT (DD)	1
214	103804	SUPPORT, PAPER - ENTRANCE	1

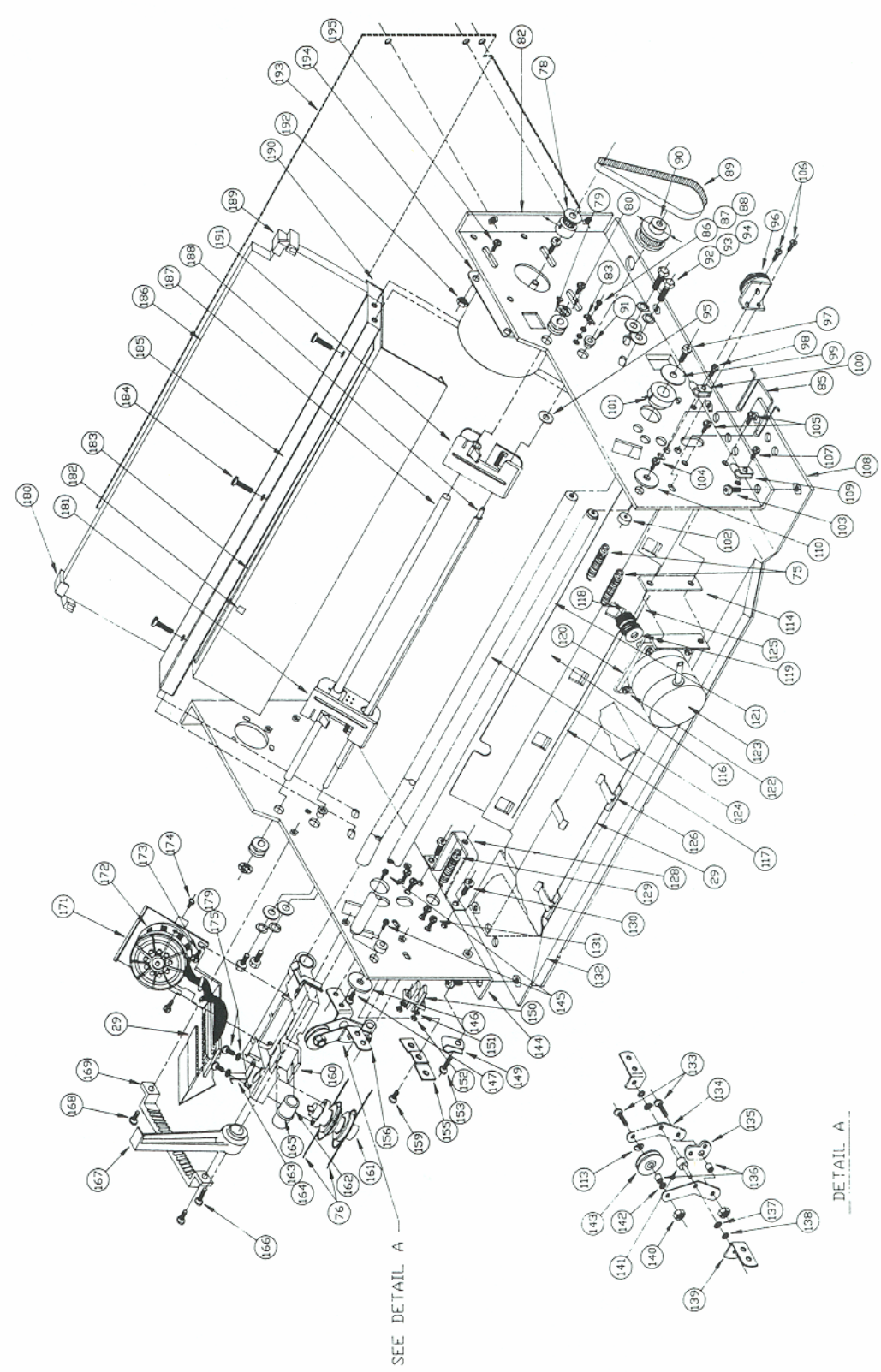
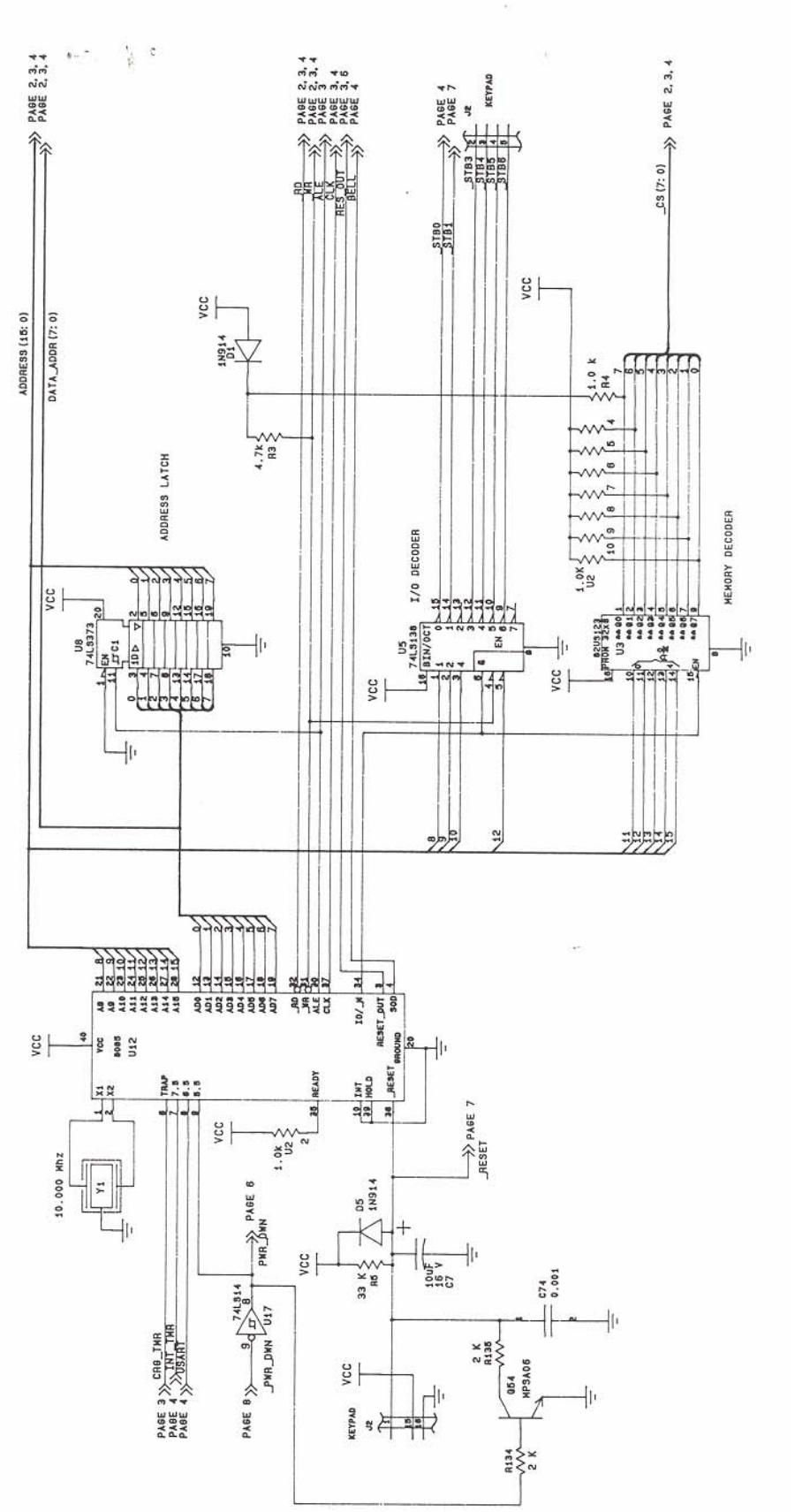


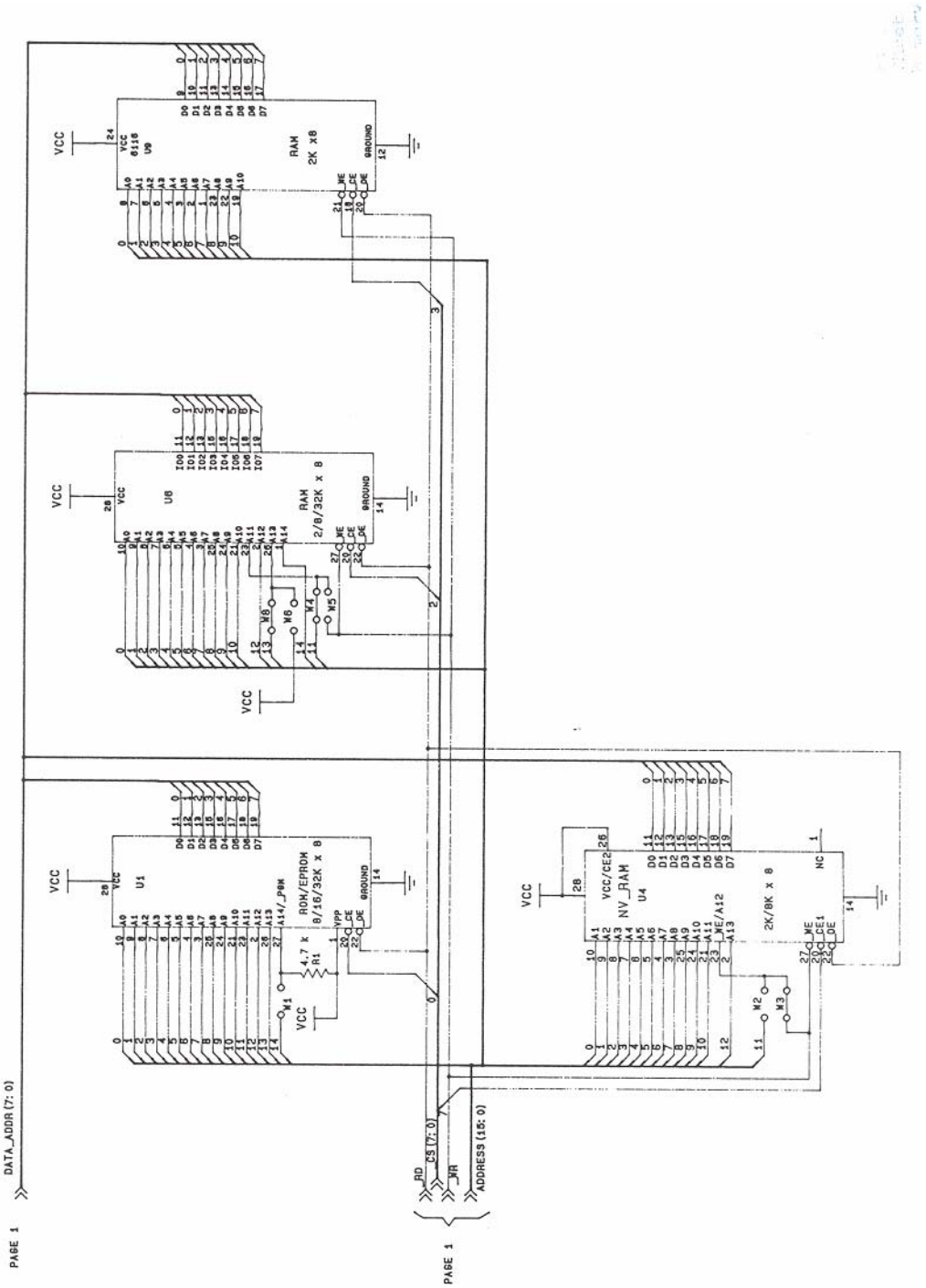
Figure 4.19: Illustrated Parts Breakdown DD

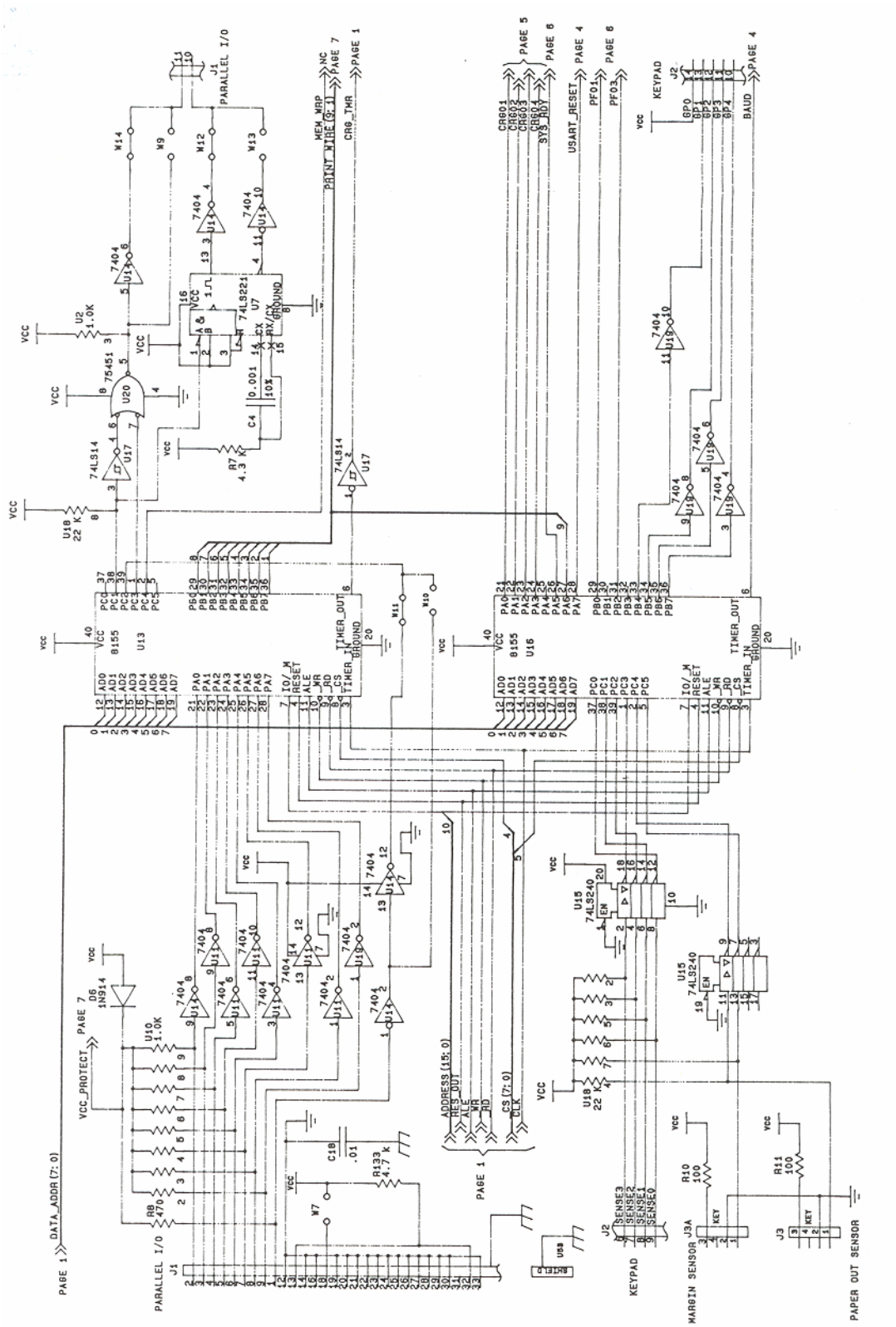
APPENDIX A

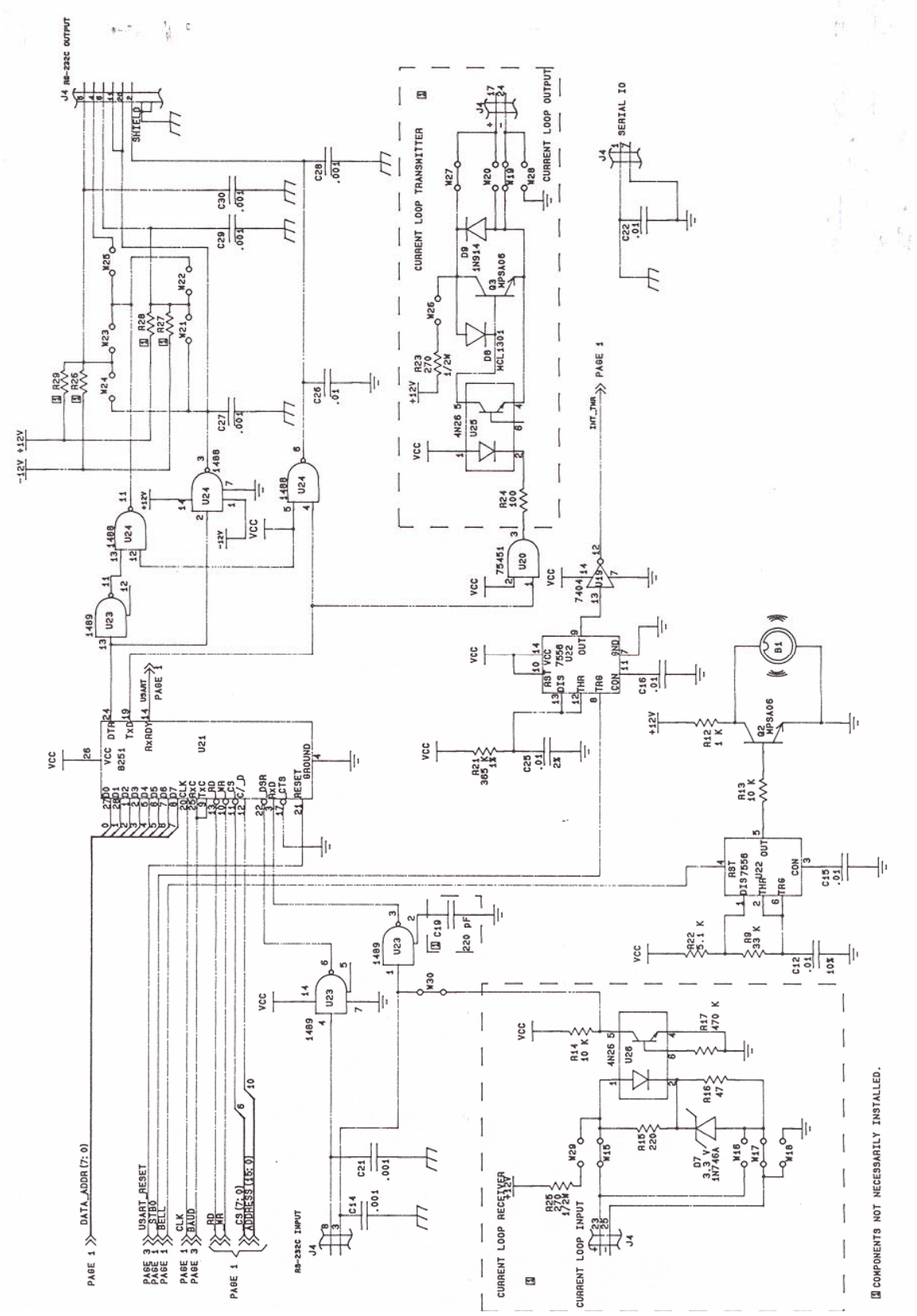
This section provides updated schematics for the Main Controller Board (Figure A-1)

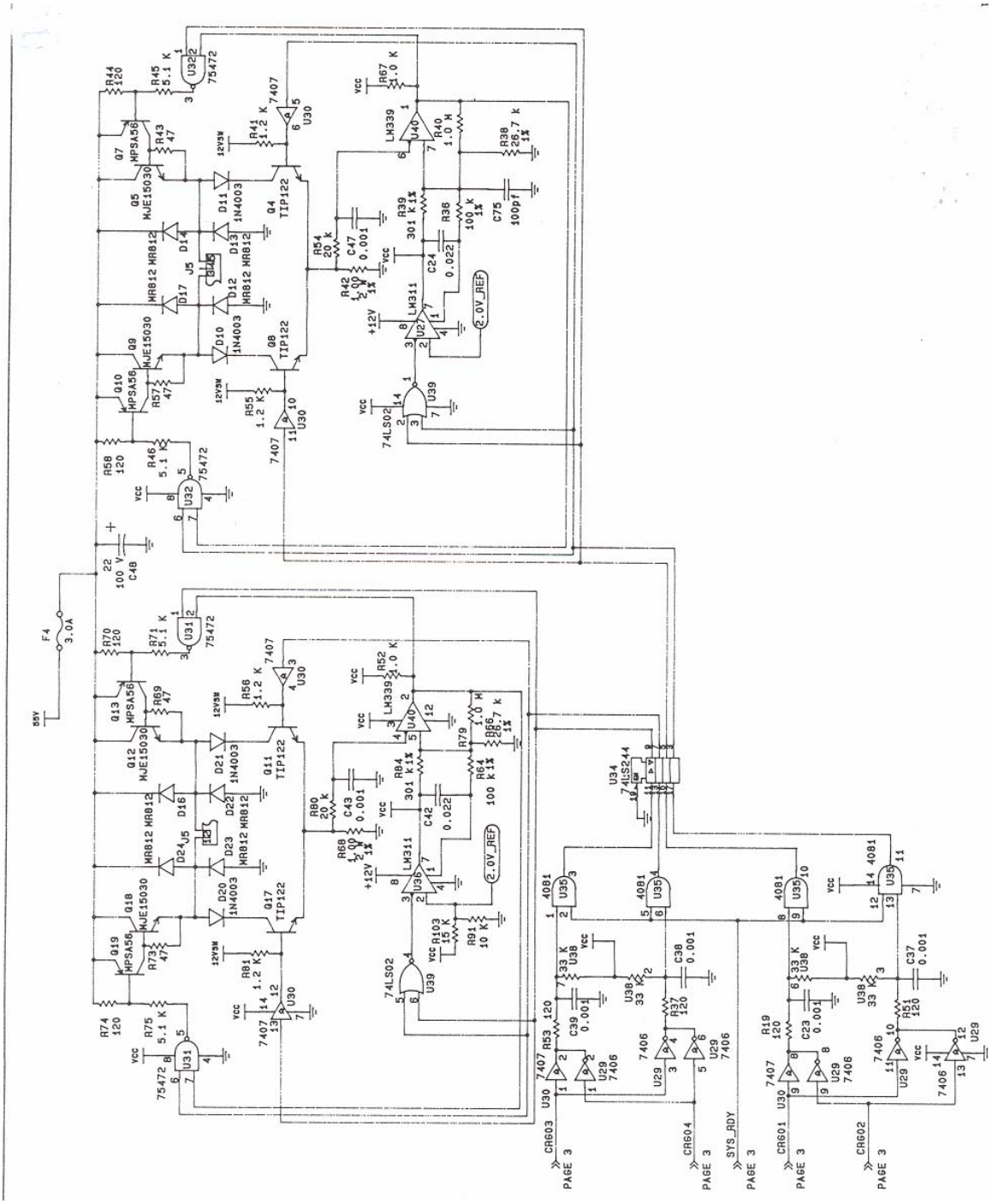
Part No.: 105766 (Sheets 1 – 8)
PC Board: 105767

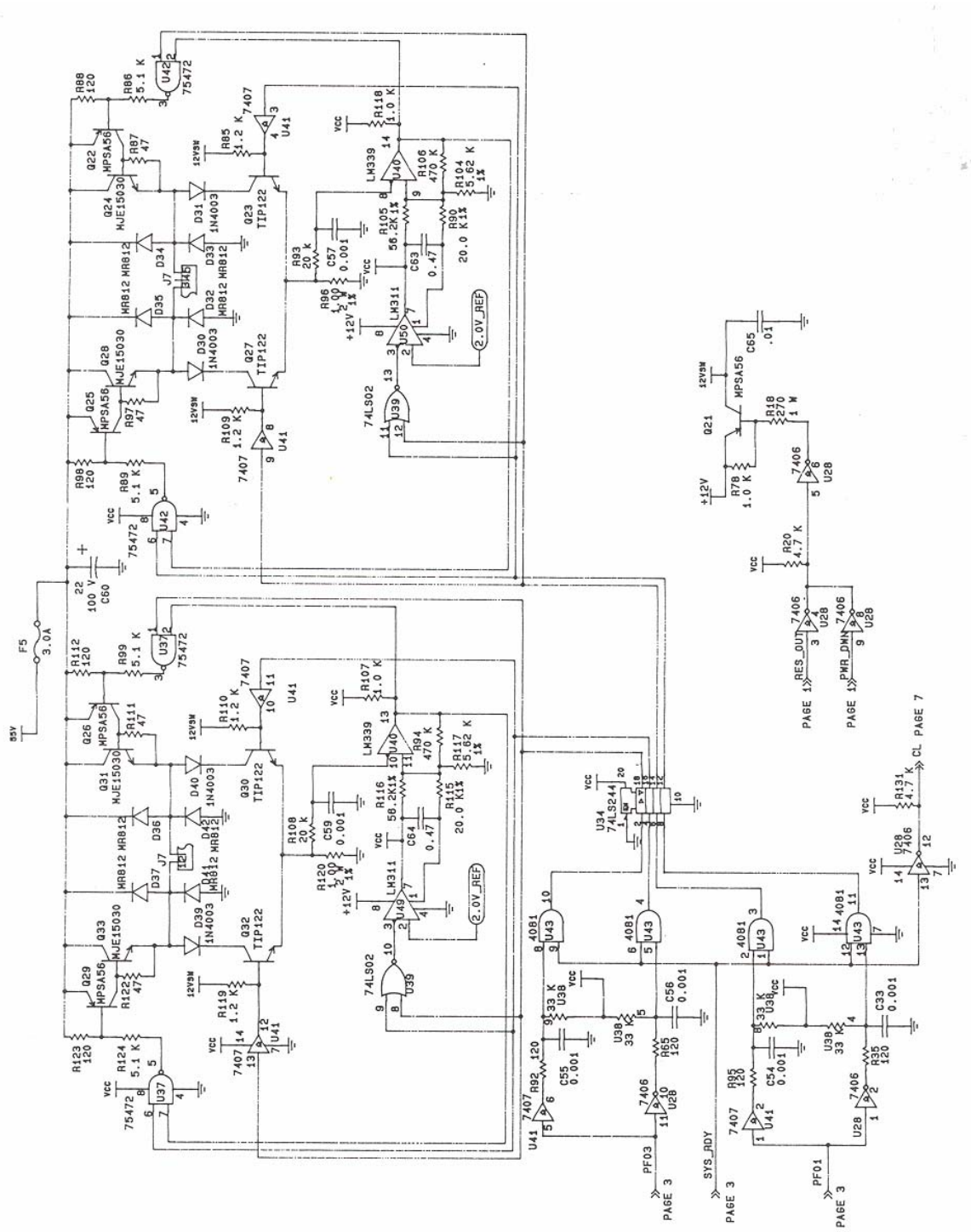

ADDRESS (16: 0)
DATA_ADDR (7: 0)
ADDRESS LATCH
I/O DECODER
MEMORY DECODER
KEYPAD
VCC
10.000 Mhz
RESET
PWR_DWN
CS (7: 0)

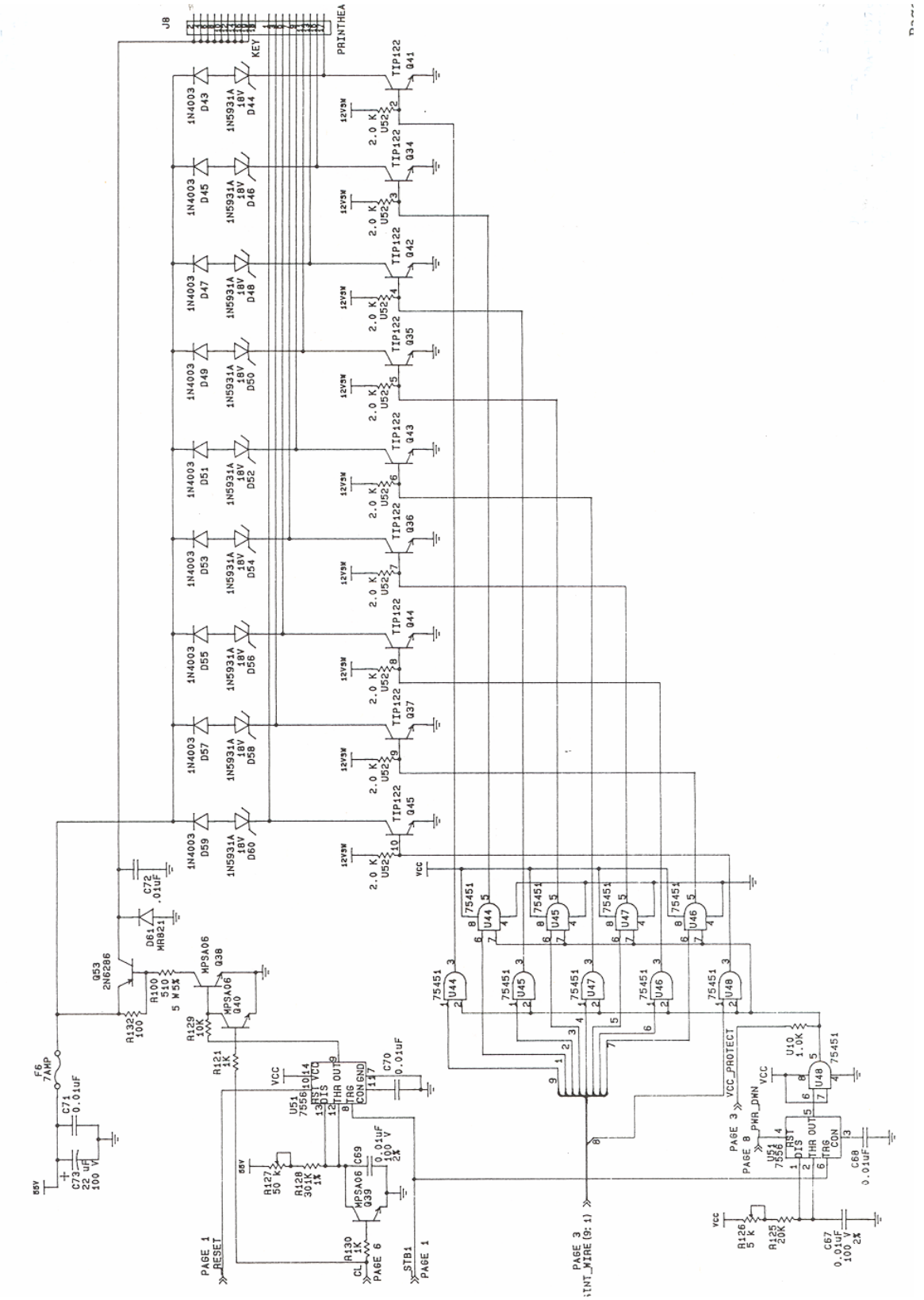

DATA_ADDR (7: 0)
PAGE 1
RD
CS (7: 0)
WR
ADDRESS (15: 0)
PAGE 1
VCC
U9
RAM
2K x8
GROUND
U6
RAM
2/8/32K x 8
U1
ROM/EPROM
8/16/32K x 8
4.7 k
R1
U4
NV_RAM
2K/8K x 8
W1
W2
W3
W4
W5
W6
W8




J4 RS-232C OUTPUT
SHIELD
CURRENT LOOP TRANSMITTER
CURRENT LOOP OUTPUT
J4 SERIAL IO
+12V
-12V
VCC
U21
U8251
U20
75451
U22
7555
U23
1489
U24
1488
U25
4N26
U26
7404
U19
DTR
TxD
RxRDY
USART
PAGE 1
RESET
GROUND
INT_PWR
B1
Q2 MPSA06
Q3 MPSA06
D9 1N914
D8 MCL1301
D7 3.3V 1N746A
R12 1 K
R13 10 K
R14 10 K
R15 220
R16 47
R17 470 K
R21 365 K 1%
R22 5.1 K
R23 270 1/2W
R24 100
R25 270 1/2W
R26
R27
R28 2.7K
R29 2.7K
C9 (7:0)
ADDRESS (15:0)
DATA_ADDR (7:0)
USART_RESET
STBO
BELL
CLK
BAUD
RD
WR
RS-232C INPUT
CURRENT LOOP RECEIVER
CURRENT LOOP INPUT
C12 .01 10%
C15 .01
C16 .01
C19 220 pF
C20 .001
C21 .001
C22 .01
C25 .01 2%
C26 .01
C27 .001
C28 .001
C29 .001
C30 .001
W16
W17
W18
W20
W21
W22
W23
W24
W25
W26
W27
W28
W29
W30
PAGE 1
PAGE 3
COMPONENTS NOT NECESSARILY INSTALLED.






J8
PRINTHEA
KEY
1N4003
1N5931A 18V
TIP122
2.0 K
12V5W
75451
VCC
VCC_PROTECT
PHR_DWN
PAGE 1 RESET
PAGE 6
STB1
PAGE 1
PAGE 3
PAGE 8
F6 7AMP
C71 0.01uF
C73 22 uF 100 VC
C72 .01uF
D61 MR821
Q53 2N6286
R100 510 5 W 5%
R132 100
R129 10K
R121 1K
MPSA06
R127 50 K
R120 301K 1%
R130 1K
C69 0.01uF 100 V 2%
C70 0.01uF
U51 7556
R126 5 K
R125 20K
C67 0.01uF 100 V 2%
C68 0.01uF
U10 1.0K

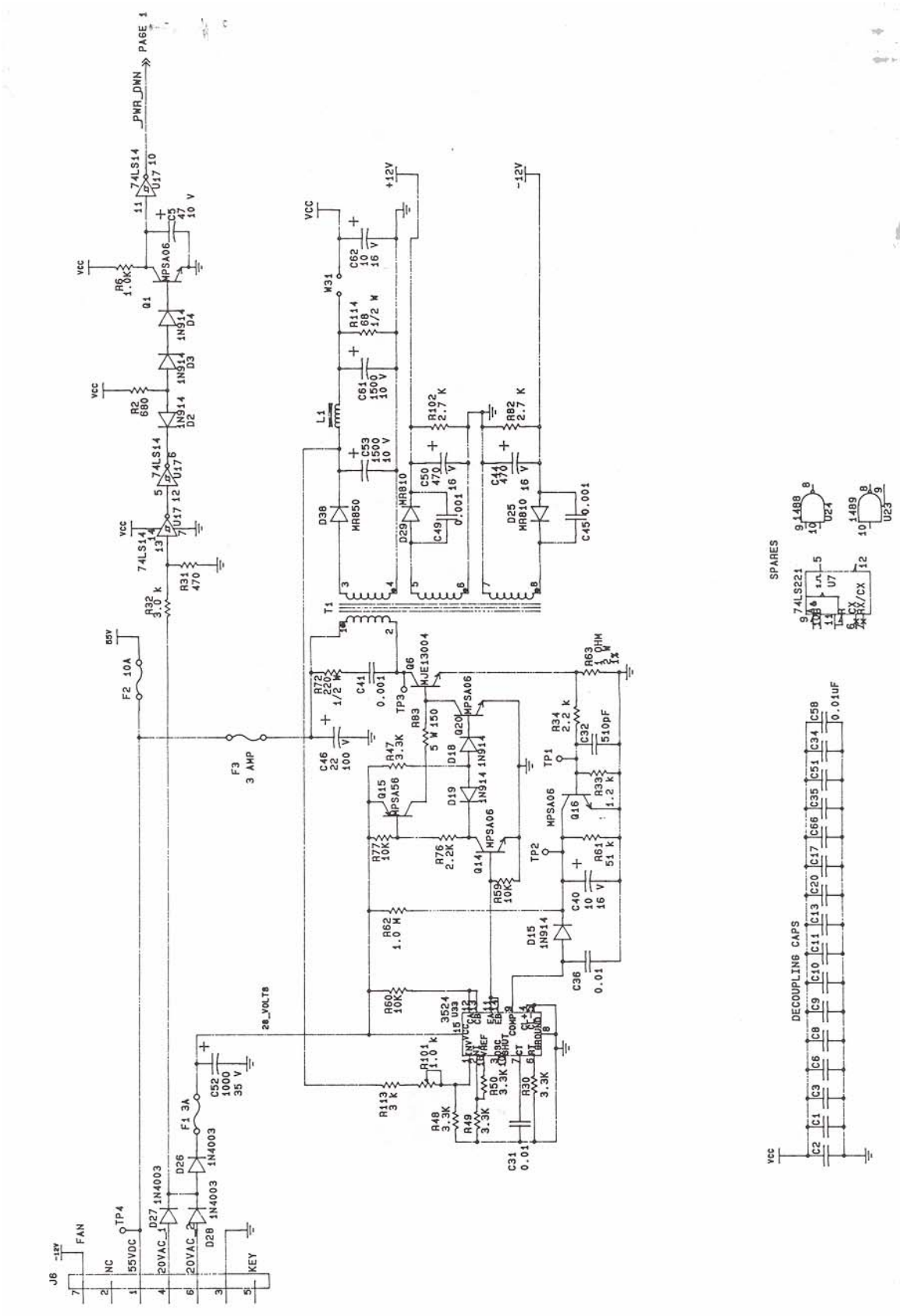
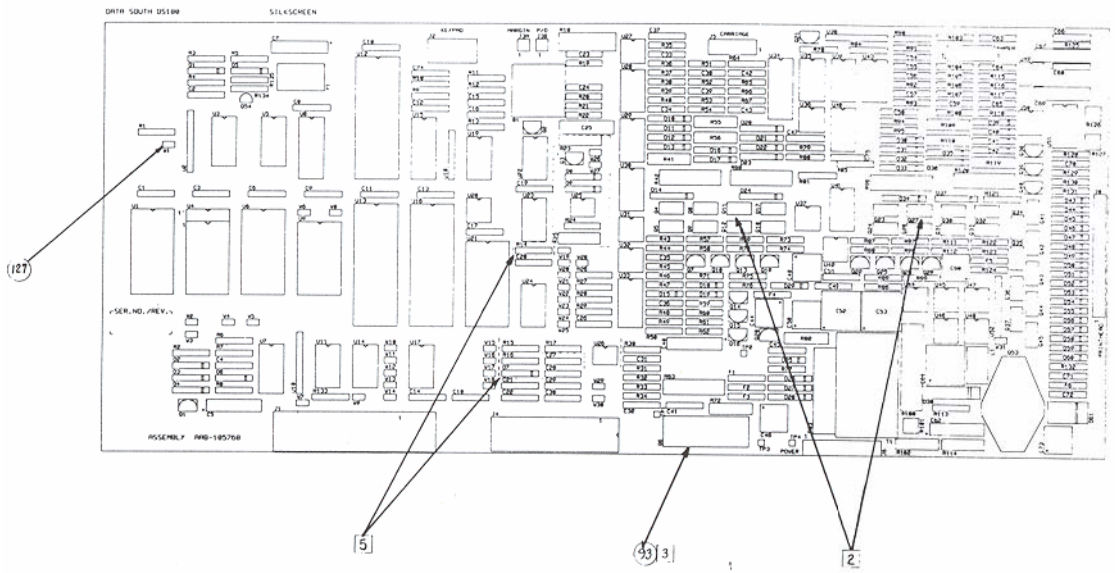
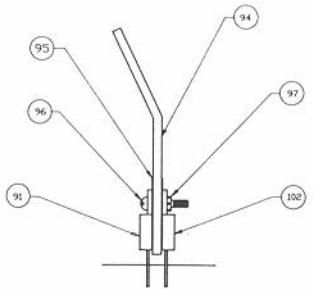

PWR_DWN
PAGE 1
74LS14
U17
MPSA06
Q1
1N914
D4
D3
D2
R2
680
R6
1.0K
C5
10 V
VCC
+12V
-12V
R114
68
1/2 W
C61
1500
10 V
C62
10
16 V
W31
L1
C53
1500
10 V
C50
470
16 V
C41
470
16 V
R102
2.7 K
R82
2.7 K
D38
MR850
D29
MR810
D25
MR810
C49
0.001
C45
0.001
R31
470
R32
3.0 k
T1
F2 10A
85V
F3
3 AMP
R72
220
1/2 W
C46
22
100 V
C41
0.001
Q6
MJE13004
TP3
R83
5 W 150
Q20
MPSA06
D18
1N914
R47
3.3K
Q15
MPSA56
D19
1N914
R77
10K
R76
2.2K
Q14
MPSA06
R59
10K
R62
1.0 M
D15
1N914
C40
10
16 V
R61
51 k
TP2
Q16
MPSA06
R33
1.2 k
C32
510pF
TP1
R34
2.2 k
R63
1 OHM
1%
C36
0.01
R60
10K
R113
3 k
R101
1.0 k
R48
3.3K
R49
3.3K
R50
3.3K
R30
3.3K
C31
0.01
3524
28_VOLTS
C52
1000
35 V
F1 3A
D26
1N4003
D27
1N4003
D28
1N4003
J6
-12V
FAN
NC
TP4
55VDC
20VAC_1
20VAC_2
KEY
SPARES
74LS221
U7
1488
U24
1489
U23
DECOUPLING CAPS
C1
C2
C3
C6
C8
C9
C10
C11
C13
C20
C17
C66
C35
C51
C34
C58
0.01uF

Figure A.2: Controller Board Assembly
Part No. 105768 (Sheet 1 and 2)
PC Board 105767

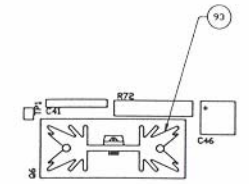


NOTES:

1. REFER TO SHEET 2 FOR BOM
2. ASSEMBLE VERTICAL HEATSINK (ITEM 94) ONTO BOARD USING INSULATOR PADS (ITEM 95), SCREWS (ITEM 96), AND NUTS (ITEM 97) AS SHOWN IN DETAIL A.
3. ASSEMBLE SINGLE HEATSINK ASSEMBLY (ITEM 93) ONTO BOARD AS SHOWN IN DETAIL B.
4. ASSEMBLE TO-3 HEATSINK ASSEMBLY (ITEM 92) ONTO BOARD IN LOCATION Q-53.
5. COMPONENTS ARE INSTALLED IN THE -2 CONFIGURATION ONLY.



DETAIL A
TYPICAL 2 PLACES
SCALE: NONE



DETAIL B
SCALE: NONE

ITEM	PART NO	DESCRIPTION	CONFIGURATION 105768-1 QTY	CONFIGURATION 105768-2 QTY	QTY	QTY	REF DESIGNATOR [3]
1	CAC-100102	RESIST, 33K 1/4W CF 5%	6	6			(R) 5,9,27,29, [26,28]
2	CAC-100089	RESIST, 100 OHM 1/4W CF 5%	3	4			(R) 10,11,132 [R24]
3	CAC-100088	RESIST, 47 OHM 1/4W CF 5%	8	9			(R) 4357,67,71 87,97,111-122 [R16]
4	CAC-100090	RESIST, 120 OHM 1/4W CF 5%	16	16			(R) 1,2,3,4,6,7,8,9,10,12,13,14,15,16,17,18 19,20,21,22,23,24,25,26,27,28,29,30,31,32
5	CAC-100097	RESIST, 5.1K 1/4W CF 5%	9	9			(R) 35,43,44,71,73 84,85,93,124
6							
7							
8	CAC-100093	RESIST, 1K 1/4W CF 5%	10	10			(R) 4,6,12,58,67,78 107,118,125,126
9	CAC-100098	RESIST, 10K 1/4W CF 5%	6	7			(R)3,59,62,77,91,129 [R14]
10	CAC-100100	RESIST, 20K 1/4W CF 5%	5	5			(R) 54,80,93,108,125
11	CAC-101047	RESIST, 5.62 K 1% 1/4W	2	2			(R) 104,117
12	CAC-101115	RESIST, 680 OHM 1/4W 5%	1	1			(R) 2
13	CAC-100092	RESIST, 470 OHM 1/4W CF 5%	2	2			(R) 8,31
14	CAC-100132	RESIST, 100 K 1/4W 1%	2	2			(R) 36,64
15	CAC-100096	RESIST, 3.3K 1/4W 5%	5	5			(R) 38,47-50
16	CAC-100095	RESIST, 3K 1/4W CF 5%	2	2			(R) 32,113
17	CAC-100099	RESIST, 15K 1/4W CF 5%	1	1			(R) 103
18	CAC-100105	RESIST, 1M 1/4W CF 5%	3	3			(R) 40,62,79
19	CAC-100094	RESIST, 2.2K 1/4W CF 5%	2	2			(R) 34,76
20	CAC-101043	RESIST, 1.2K 1/4W CF 5%	9	9			(R) 33,41,55,56,81 84,109,111,119
21	CAC-101300	RESIST, 56.2K 1/4W 1%	2	2			(R) 105,116
22	CAC-102041	RESIST, 4.7K 1/4W 5%	4	4			(R) 3,20,131,133,
23	CAC-100902	RESIST, 4.3K 1/4W CF 5%	1	1			(R) 7
24	CAC-100109	RESIST, 365K 1/4W MF 1%	1	1			(R) 21
25	CAC-102449	RESIST, 51k 1/4W 5%	1	1			(R) 61
26	CAC-100110	RESIST, 68 OHM 1/2W CF 5%	1	1			(R) 114
27	CAC-100111	RESIST, 220 OHM 1/2W CF 5%	1	1			(R) 72
28	CAC-100114	RESIST, 1 OHM 2W WW 1%	5	5			(R) 42,63,68,96,120
29	CAC-100112	RESIST, 270 OHM 1W WW 5%	1	1			(R) 18
30	CAD-100043	CAP, FILM .01mF 2%	3	3			(C) 25,67,69
31	CAD-101048	CAP, ELEC AX 10mF 16V	3	3			(C) 7,48,62
32	CAD-101053	CAP, CER-AX 510pF 50V 10%	1	1			(C) 32
33	CAC-102451	RESIST, 26.7K 1/4W 1%	2	2			(R) 38,66
34	CAC-103385	RESIST, NET SIP 33K 9 PIN	1	1			(U) 38
35	CAD-105348	CAP, ELEC 1000mF 50V	1	1			(C) 52
36	CAD-101052	CAP, CER-AX .001mF 50V 10%	23	23			(C) 4,14,21,23,27-30 33,37-39,41,43, 45,47,49,54-57,59,74
37	CAC-103400	RESIST, 301K 1/4W 1%	3	3			(R) 39,84,128
38	CAC-100122	RESIST, 470K 1/4W 5%	2	3			(R) 94,106 [R17]
39	CAH-100070	DIODE, SIGNAL 1N914	9	10			(D) 1-6,15,18,19 [D9]
40	CAH-100577	DIODE, POWER MR812	18	18			(D) 12-14,17,22-25, 27,31-37,41,42
41	CAC-105508	RESIST, 20K 1/4W 1%	2	2			(R) 90,115
42							
43	CAH-100067	DIODE, POWER 1N4003	20	20			(D) 10,11,26,38,42,43, 78-88,91,92,94,95,97, 99,100,101,103,104,106, 107,109,110,112,113,115, 117,119,120,121,123,127
44	CAD-102141	CAP, CER 0.01 MF 100V 10%	29	29			(C) 1-3,8,9-13,15-18,20, 22,24,31-34-36,51,58, 63,64,68,70-72
45	CAD-103730	CAP, 0.47 MF CC AX Z5U	2	2			(C) 63,66
46	CAD-101162	CAP, CER AXIAL 100 pF 50V	1	1			(C) 75
47	CAH-105491-10	PICAFUSE, 7 AMP	1	1			(F) 6
48	CAH-105491-5	PICAFUSE, 3 AMP	4	4			(F) 1,3-5
49	CAD-105665	CAP, ELECT-AX 47MF 10V	1	1			(C) 5
50	CAD-103285	CAP, 0.022 MF	2	2			(C) 24,42
51	CAC-100014	BUFFER, 75451	6	6			(U) 28,44-48
52	CAC-100024	IC-LM339	1	1			(U) 40
53	CAC-100025	IC-4081	2	2			(U) 35,43
54	CAC-100700	IC-74LS244	1	1			(U) 34
55	CAC-100705	IC-74LS02	1	1			(U) 39
56	CAC-101131	IC-LM311	4	4			(U) 27,36,49,50
57	CAC-101540	IC-7407	2	2			(U) 30,41
58	CAC-101984	IC-75472	4	4			(U) 31,32,37,42
59	CAB-101917	SHIELDED, RCEP RA 25 POS	1	1			(J) 4
60	CAB-105537-5	HEADER, VERT LOCKING 1X5 .156	2	2			(J) 5,7
61	CAB-100151	HEADER, 1X19	1	1			(J) 8
62	CAS-100155	SOCKET, 40 PIN	3	3			(U) 12,13,16
63	CAS-100154	SOCKET, 28 PIN	3	3			(U) 16,21
64							
65	CAB-101638	SHIELDED HEADER RA-2X18	1	1			(J) 1
66	CAB-100150	HEADER, VERT 2X2	2	2			(J) 4A, 4B

ITEM	PART NO	DESCRIPTION	CONFIGURATION 105768-1 QTY	CONFIGURATION 105768-2 QTY	QTY	QTY	REF DESIGNATOR [3]
67	CAA-105767	PCB, CONTROL XL 300/DD FAB	1	1			SEE SHEET 1 OF 1
68	CAE-101098	IC-74LS240	1	1			(U) 15
69	CAE-100891	IC-74LS373	1	1			(U) 8
70	CAE-100005	GATE TTL 74LS138 PC	1	1			(U) 5
71							
72	CAE-100018	GATE TTL 7404 PC	3	3			(U) 1,14,19
73	CAE-100031	IC-52474LS221N	1	1			(U) 2
74	CAE-100029	IC-74LS14N	1	1			(U) 17
75	CAE-100008	INTERFACE MC1489P	1	1			(U) 23
76	CAE-100007	INTERFACE MC1488P	1	1			(U) 24
77	CAE-100015	PULSE WIDTH MOD-LM3524N	1	1			(U) 33
78	CAE-100017	DUAL TIMER-IEM 7556IPD	2	2			(U) 22,51
79	CAC-100903	RESIST, 5K2 5W WW 5%	1	1			(R) 100
80	CAC-103113	RESIST, 150 OHM 5W WW 5%	1	1			(R) 83
81	CAJ-105653-7	POTENTIOMETER, 1K	1	1			(R) 101
82	CAJ-105653-9	POTENTIOMETER, 5K	1	1			(R) 126
83	CAJ-105653-12	POTENTIOMETER, 50K	1	1			(R) 127
84	CAB-100046	CAP, ELEC 22 MF 100V	4	4			(C) 46,48,60,73
85	CAB-100047	CAP, ELEC 470 MF 16V	2	2			(C) 44,58
86	CAB-100049	CAP, ELEC 1500 MF 10V	2	2			(C) 53,61
87	CAH-100071	DIODE, POWER MR821	1	1			(D) 61
88	CAH-100072	DIODE, POWER MR850	1	1			(D) 38
89	CAI-100081	TRANS, SIG MPSA06	9	10			(Q) 1,2,14,16,20,38-40,54 (Q3)
90	CAI-100083	TRANS, SIG MPSA56	10	10			(Q) 7,8,9,11,15,19,21, 22,23,24,25
91	CAI-101109	TRANS, POWER TIP122	17	17			(Q) 4,5,10,12,17,26,27,30 31,34-37,41-43
92	AAB-101138	TO-3 HTSINK ASSY 2N6286	1	1			(Q) 53
93	AAB-100477	SINGLE HEATSINK ASSY	1	1			SEE SHEET 1 OF 2
94	CAV-103543	HEATSINK, VERTICAL	2	2			SEE SHEET 1 OF 2
95	CAV-103552	INSUL, VERTICAL SINK	4	4			SEE SHEET 1 OF 2
96	BAN-101084	SCREW, NYLON #4-40 X 1/2	8	8			SEE SHEET 1 OF 2
97	BAN-100239	NUT, HEX HEAD #4-40 KEP	8	8			SEE SHEET 1 OF 2
98							
99	CAF-100593	TRANS, POWER CONVERTER	1	1			(T) 1
100	AAD-100475	TOROID CHOKE SUB-ASSY	1	1			(L) 1
101	CAS-100161	SOCKET, 24 PIN	1	1			(U) 4
102	CAI-100079	TRANS, POWER MJE15030	8	8			(Q) 3,9,12,18,22,28,31,33
103	CAC-100908	SIP, PULL-UP 1K OHM 10 PIN	2	2			(U) 2,10
104	CAB-103734	HEADER, 2 PIN	2	2			(W) 36, 7
105	CAB-103735	SHUNT, POST	1	1			(W) 31
106	CAC-105678	NETWORK, SIP, 2K OHMS	1	1			(U) 52
107	CAC-100059	RESIST, NET-SIP 22K 8 PIN	1	1			(U) 18
108	CAB-101530	HEADER, VERT 1X7	1	1			(J) 6
109	CAB-103280-1	HEADER, VERT 2X8 LOCKING	1	1			(J) 2
110							
111	CAE-101026	MPU 8085A-2 HI SPEED 5MHZ	1	1			(U) 12
112							
113	CAE-100011	TIMER, IORAM P8155 HI SPD 5 MHz	2	2			(U) 13,16
114	CAE-100012	USART P8251A 5 MHz	1	1			(U) 21
115	CAD-100917	ALARM PIEZO PKM	1	1			BELL
116	CAE-102349	RAM, CMOS 2K X 8 ZERO POWER	1	1			(U) 4
117							
118	AFW-105950	XL 300 CONT PROG PROM	1	1			(U) 3
119	CAS-100145	SOCKET, 16 PIN	1	1			(U) 3
120	CAC-102038	IC-7406	2	2			(U) 28,29
121	CAC-100134	RESIST, 270 OHM .50 W CF 5%		2			(R 23,25)
122	CAH-100076	DIODE, LIMIT- MCL1301		1			(D 8)
123	CAC-100091	RESIST, 220 OHM .25 W CF 5%		1			(R 15)
124	CAG-100020	PHOTO TX-4N26		2			(U 25,26)
125	CAH-100066	DIODE, ZENER 1N914		1			(D 7)
126							
127	CAR-100975	WIRE, JUMPER	.25"	.25"			(W) 1
128	CAQ-100916	CRYSTAL, 10.0 MHz	1	1			(Y) 1
129	CAE-103436	RAM, STATIC 32K X 8 150 NS	1	1			(U) 6
130	CAN-105491-8	PICAFUSE 10 AMP	1	1			(F) 2
131	CAC-101346	RESIST, 2.7K .25W 5%	2	2			(R) 82, 102
132	CAH-105944	DIODE, ZENER 1N5931A	9	9			(D) 44,46,48,50,52,54,56,58,60
133	CAC-102450	RESIST, 2K .25W 5%	2	2			(R) 134, 135

NOTES:

1) SEE SHEET 1 OF 2 FOR ACTUAL LOCATION OF CHART ITEMS LISTED ABOVE

2) REFERENCE DOCUMENT: AAI-105766 SCHEMATIC, XL-300

[3] ITEMS UNDER REFERENCE DESIGNATOR IN BRACKETS [ ] ARE USED FOR SPECIFIC CONFIGURATIONS

4) CONFIGURATION CHART

PART NUMBER	DESCRIPTION
AAB-105768-1	XL 300 CONT.BOARD ASM
AAB-105768-2	XL 300 CONT.BOARD ASM W/CURRENT LOOP